

GOODMAN RESEARCH GROUP, INC.
Program Evaluation • Consultation • Market Research

***Pushing the Limits:
Making Sense of Science
Year 3 Progress Report***

PREPARED BY

Karen C. Gareis, Ph.D.
Emma Lukasiewicz, B.A.
Irene F. Goodman, Ed.D.

SUBMITTED TO

Daniel N. Rockmore
Dartmouth College

August 31, 2013

TABLE OF CONTENTS

Executive Summary	2
Introduction.....	4
GRG’s Evaluation of the PTL Program	4
Methods	6
Evaluation Design for Pilot Libraries.....	6
Procedures	6
Results.....	8
Who Are the Pilot Librarians and Science Partners?	8
How Useful Were the Pilot Professional Development Workshop and Other Materials?.....	11
How Successful Was the Implementation of the PTL Programming?	14
What Was the Impact of the PTL Programming	20
How Could the PTL Program Be Improved?	25
Upcoming Evaluation Activities.....	28
List of Appendices	29
A: PTL Program Dates at Pilot Libraries	29
B: Annotated Librarian Background Survey	29
C: Annotated Science Partner Background Survey	29
D: Annotated Librarian Professional Development Survey	29
E: Annotated Librarian Post-Programming Survey	29
F: Annotated Science Partner Post-Programming Survey.....	29
G: Annotated Patron Post-Event Survey	29



This material is based upon work supported by the National Science Foundation under Grant No. ISE # DRL-1010577. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

EXECUTIVE SUMMARY

Pushing the Limits: Making Sense of Science (PTL) is an NSF-funded program designed to build the capacity of rural and small libraries to enhance public understanding of science and math. The program provides professional support, technical assistance, and funding for librarians and local science partners to co-facilitate a series of science café-style guided public discussions with adult patrons using books and specially produced video segments.

External evaluator Goodman Research Group, Inc. conducted the second formative evaluation, focusing on the professional development (PD) for the pilot librarians and on the implementation of the Limits programming in the 20 pilot libraries.

METHODS

GRG's research design for Year 3 of the PTL program included online background and post-programming surveys for the 20 pilot librarians and their science partners, online professional development (PD) surveys for the librarians, and, at a sample of five libraries, a patron survey administered via paper and pencil after one PTL event. Response rates for librarians were excellent, ranging from 90-100%. The corresponding rates for science partners were somewhat lower, but still very good, ranging from 77-81%.

KEY FINDINGS

- The pilot libraries have fairly low staffing, volunteer, and STEM resources. However, the pilot librarians are an accomplished and motivated group in terms of PD and adult programming experience. Only a third had prior experience with science-related adult programming, in contrast to their science partners, two-thirds of whom had been involved in prior public science programming for adults.
- Librarians rated the PD workshop very highly, particularly the materials and the workshop leaders. The majority of the librarians reported that this PD had helped them develop specific competencies in planning, coordinating, and co-facilitating PTL programs. Several of the science partners went out of their way to compliment the webinar and materials that were provided for them as well.
- Both librarians and science partners reported great success in planning the PTL programming, engaging their audiences, and facilitating lively discussions. Some librarians noted the challenges of promoting the programming, particularly to younger audiences.

- The PTL programming was very successful in engaging library patrons. The science partners, the audience discussion, and the videos were the most engaging components of the programming; the books were somewhat less appealing.
- The PTL programming was successful in drawing a crowd that was not necessarily already interested in STEM topics; about two-thirds did not have a great deal of pre-existing knowledge of or interest in STEM topics.
- Library patrons were extremely engaged by the PTL event, especially in terms of holding their interest and making them want to attend other similar programming. They also reported that the event had piqued their interest in similar programming and topics.
- Librarians made great strides in both ability and interest in facilitating future science programming. They were more confident in their science knowledge and their skills in helping patrons locate science resources. Over three-quarters are *very* or *extremely* likely to continue facilitating adult science programming in their library. Most of the science partners reported being *very* or *extremely* likely to continue their involvement with public science programming based on their experiences with the PTL program.
- Suggested improvements include selecting shorter books with more science content, giving greater emphasis to the videos, providing more marketing assistance, providing information and materials further in advance, and offering a means for the librarians to continue sharing ideas.

UPCOMING EVALUATION ACTIVITIES

- During Year 4 of the evaluation, GRG will continue conducting the summative evaluation of the 75 rollout libraries.
- Evaluation activities will include the following:
 - Online baseline and post-programming surveys for the 75 rollout librarians.
 - An online retrospective survey for the 75+ science partners.
 - Brief paper surveys for library patrons at 20 randomly selected libraries after the first and last PTL event held at that library.
 - Observations at one PTL event at each of 10 libraries.

INTRODUCTION

Pushing the Limits: Making Sense of Science (PTL) is an NSF-funded program designed to build the capacity of rural and small libraries to enhance public understanding of science and math. The program provides professional support, technical assistance, and funding for librarians and local science partners to co-facilitate a series of four science café-style guided public discussions with adult patrons.

Discussions center around the notion that we all use science in our everyday lives to “push limits.” Each topical unit — Knowledge, Nature, Survival, and Connection — is linked to a popular work of literature and includes two specially produced brief video segments, one with the author and a second human interest story embodying relevant themes for discussion.

Pushing the Limits was created by an interdisciplinary team of library professionals, scientists, and filmmakers from Dartmouth College, Dawson Media Group (DMG), Oregon State University (OSU), the Association of Rural and Small Libraries (ARSL), and the Califa Library Group. Twenty rural and small libraries piloted the PTL program in Year 3 of the project (September 2012-August 2013). In Year 4, the program will be rolled out to 75 additional libraries.

The program aims to increase engagement with and understanding of science among two new adult audiences: rural librarians and adults in the communities they serve. The PTL program builds librarians’ capacity to support informal science education (ISE) in their communities by enhancing their competencies in coordinating and co-facilitating adult programming on science-related topics.

GRG’S EVALUATION OF THE PTL PROGRAM

Goodman Research Group, Inc., a Cambridge, Massachusetts research firm specializing in the evaluation of educational programs, materials, and services, conducted the second formative evaluation at the 20 pilot libraries during Year 3 of the PTL project and will conduct a summative evaluation at the 75 rollout libraries during Year 4.

The second formative evaluation focused on the professional development (PD) for the pilot librarians and on the implementation of the Limits programming in the 20 pilot libraries, guided by the following evaluation questions:

- How does the PD program operate to help librarians at rural and small libraries become more comfortable planning, publicizing, and facilitating public science programming in their communities? How does it support librarians’ identities as facilitators of public science programming? How can the PD be improved?
- How is the partnership model pairing librarians and local science partners working, from the viewpoints of both

librarians and science partners? Do both parties feel adequately informed and supported in their roles facilitating public ISE programming? How can the model be improved?

- How does the public ISE programming unfold? How do adult patrons at a sample of rural and small libraries respond to the events? How do librarians and science partners assess the events? In what ways can future events be strengthened?

METHODS

EVALUATION DESIGN FOR PILOT LIBRARIES

GRG's research design for Year 3 of the PTL program included background and post-programming surveys for the 20 pilot librarians and their science partners, professional development (PD) surveys for the librarians, and, at a sample of five libraries, a patron survey administered after one PTL event (see Appendix A for a schedule of PTL programming at each library). The pilot libraries held PTL events on a monthly basis, with the earliest occurring in January 2013 and the latest occurring in June 2013.

The background surveys assessed librarians' and science partners' demographics, past experience with public science programming, and initial ability and interest in facilitating public science programming. For both groups, the post-programming surveys asked for their assessments of the success of the PTL training and programming as well as their current ability and interest in facilitating public science programming. Librarians also gave feedback on the PD workshop they attended in October 2012. Finally, patrons at five PTL events reported on their interest and engagement with the PTL event they attended as well as answering some demographic questions. Completed annotated surveys for all three groups appear as Appendices B-G.

PROCEDURES

Table 1 shows the schedule of Year 3 evaluation activities and the response rate for each. These activities are described in further detail beneath the table.

Table 1.
Year 3 Evaluation Activities, Schedule, and Response Rates

	Completed	Participated/ Invited	Response Rate
Librarians			
Background survey	October 2012	20/20	100%
Professional development survey	October 2012	20/20	100%
Post-programming survey	July 2013	18/20	90%
Science Partners			
Background survey	November 2012	21/26 ^a	81%
Post-programming survey	July 2013	20/26	77%
Library Patrons			
Patron surveys at 5 library events	April 2013	77 ^b	n/a

^aAt 17 of the 20 libraries, a single science partner facilitated all four PTL events. Three libraries had multiple science partners: Greenwich had four, Richfield had three, and Bertha Voyer had two.

^bResponse rates are unavailable because patron surveys were administered at PTL events by the librarians.

All surveys for librarians and science partners were administered online, whereas patron surveys were administered on paper. To select the five libraries for patron surveys, GRG started with the three whose first PTL event was filmed by DMG.¹ GRG selected the remaining two libraries at random. All libraries distributed paper surveys to all patrons attending the library's April PTL event. In no case was this event the library's first of the series. Librarians returned completed surveys to GRG via overnight mail.

Response rates for librarians were excellent, ranging from 90-100%. The corresponding rates for science partners were somewhat lower, but still very good, ranging from 77-81%.

¹ Footage from filmed PTL events at these three libraries was used in creating the web-based professional development units for the rollout libraries.

RESULTS

In this section, we first describe the demographics and background experience of the pilot librarians and their science partners as well as their initial ability and interest in facilitating public science programming. Next we turn to the usefulness of the live PD workshop in preparing librarians to plan, coordinate, publicize, and co-facilitate the PTL programming. In terms of implementation, we present data from librarians, science partners, and patrons assessing the quality of the PTL programming and offering suggestions for improvement. Finally, we turn to the impact of the PTL programming on librarians, science partners, and patrons. Appendices B-G show quantitative and open-ended findings from all six surveys.

WHO ARE THE PILOT LIBRARIANS AND SCIENCE PARTNERS?

The 20 libraries participating in the pilot PTL program were distributed across the United States, from northwest Washington state to the southernmost point of California, from northern Maine down to South Carolina, and at various points in the central regions of the country.

Figure 1
Location of the Twenty Pilot PTL Libraries



The pilot libraries have fairly low resources. The median number of full-time staff is just two, plus between three and four part-time staffers and between six and seven volunteers. Just 15% of the libraries rate their library's STEM resources as *very good*, and 40 rate them as *good*; the rest rate them as *fair*, (40%) or *poor* (5%).

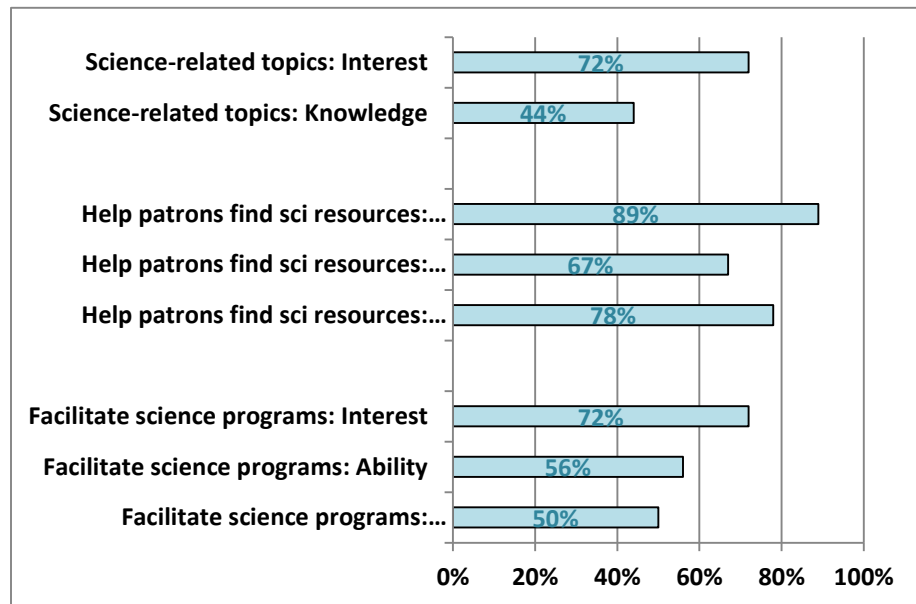
Librarians

Most of the pilot librarians are women (85%) and are White (90%). They have been employed as librarians for a median of 14.5 years (range = 2-75 years), and three-quarters (75%) have a master's or professional degree.

The pilot librarians are an accomplished and motivated group in terms of PD and adult programming experience. Almost two-thirds (60%) have participated in more than five PD programs within the past two years; almost as many (55%) have run more than 10 public programs. Most (85%) have partnered with non-librarian professionals in this programming.

However, only a third (35%) have experience with (a) science-related adult programming or (b) adult programming integrating books and videos. Not surprisingly, then, the pilot librarians see a fair amount of room for improvement in their interest, ability, and comfort in serving as informal science resources in their communities (see Figure 2). This is especially true for knowledge of science topics and for ability and comfort in facilitating science programming.

Figure 2
Librarians' Initial Interest, Ability, and Comfort as ISE Resources



N=20

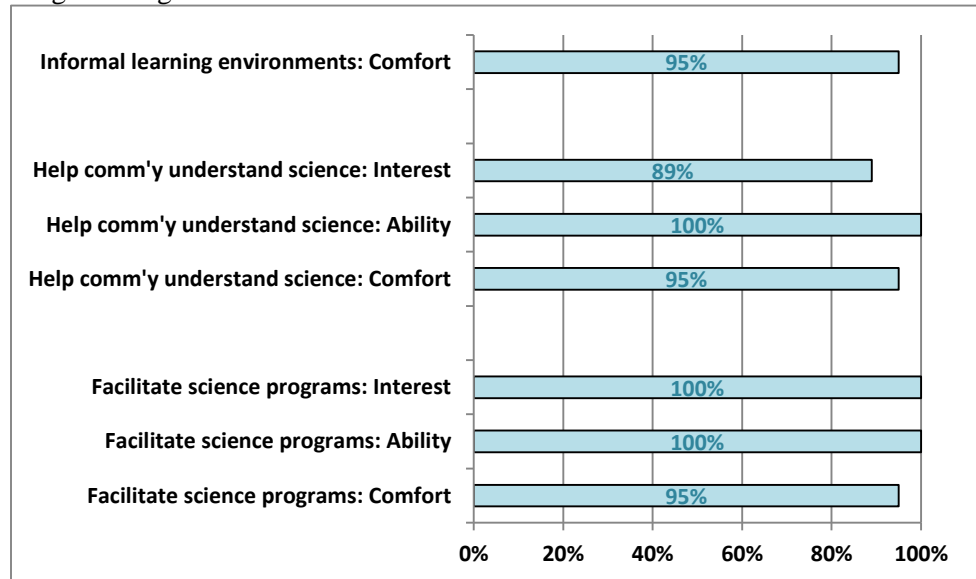
Note: Bars represent the percentages who responded *quite a bit* or *a great deal*.

Science Partners

In contrast to the librarians, two-thirds (66%) are male; however, as with librarians, 90% are White. Their median age is 52 (range = 30-79), and 71% have a master's, professional, or doctoral degree. Fully two-thirds (66%) of the science partners have been involved in public science programming for adults, including public lectures, demonstrations, science fairs, and science cafés.

Given that the science partners were selected due to their interest and experience with public science programming, it is not surprising that they give themselves quite high ratings for interest, ability, and comfort with this area, in contrast to the librarians (see Figure 3).

Figure 3
Science Partners' Initial Interest, Ability, and Comfort with Public Science Programming



N=21

Note: Bars represent the percentages who responded *quite a bit* or *a great deal*.

HOW USEFUL WERE THE PILOT PROFESSIONAL DEVELOPMENT WORKSHOP AND OTHER MATERIALS?

Librarian Professional Development Workshop

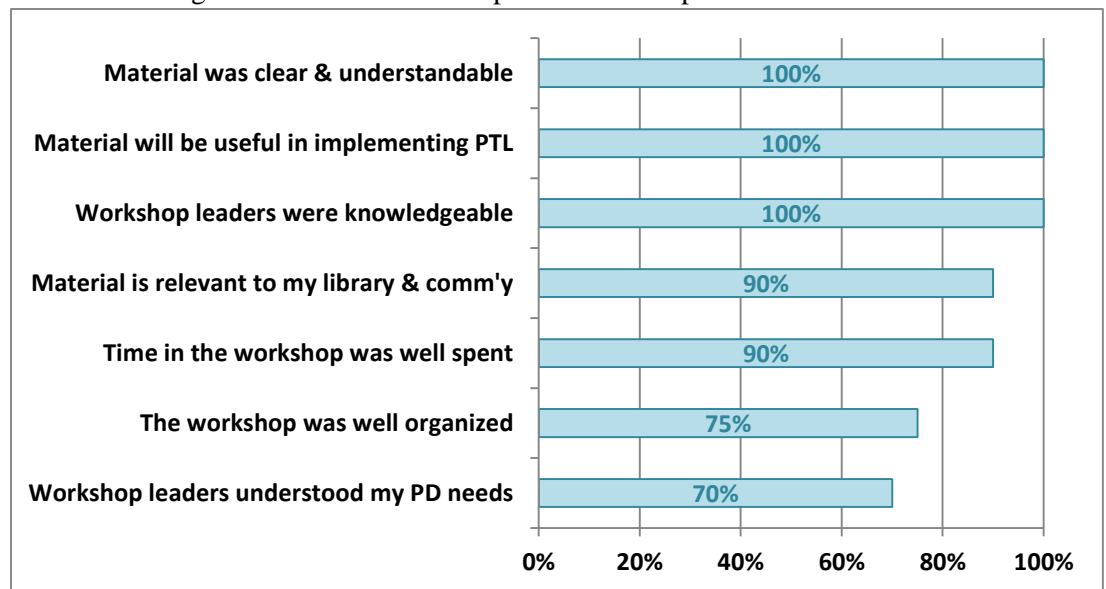
The pilot librarians traveled to Portland, OR for a PD workshop October 8-9, 2013. The workshop was designed to help them:

- Become familiar with ISE and the potential role of the library in building a community's capacity to understand science;
- Develop competencies for planning, coordinating, and co-facilitating PTL programs; and
- Prepare a customized action plan for implementing the PTL programs in their community.

The workshop was extremely well received by the librarians, as shown in Figure 4 below. As one noted,

All in all, the quality of the workshop was excellent and the level of caring and involvement was very evident. I felt privileged to participate and we are excited to offer these programs and other related programs to our patrons.

Figure 4
Librarian Ratings of Professional Development Workshop



N=20

Note: Bars represent the percentages who responded *agree* or *strongly agree*.

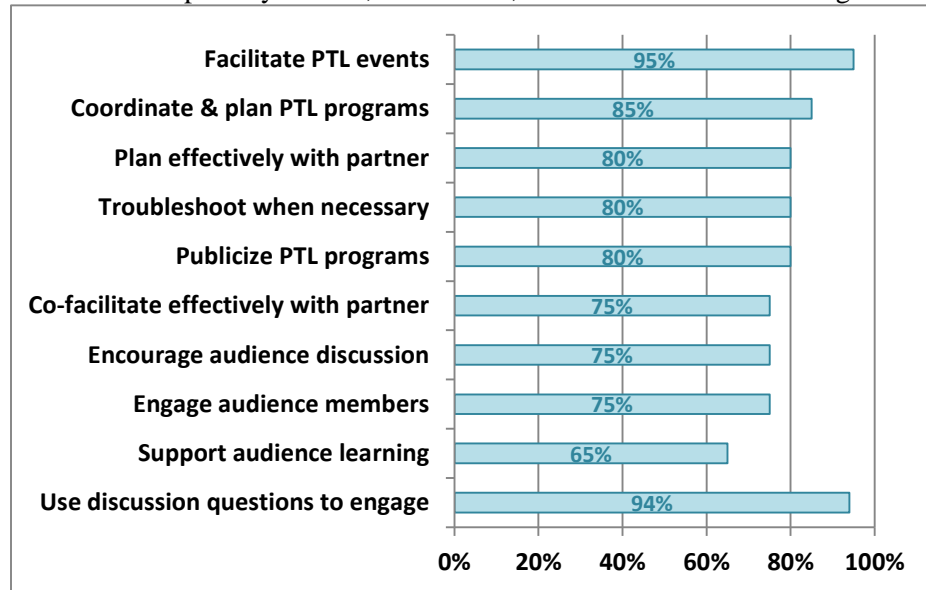
Librarians were particularly appreciative of the materials and the workshop leaders:

The organization and use of our time in the workshop was optimized. The materials supporting the presentations were appropriate and well done.

The PD was designed to help the librarians develop specific competencies in planning, coordinating, and co-facilitating PTL programs, and the majority felt that it did so (see Figure 5 below). As one librarian summed up,

I thoroughly enjoyed this conference and found it enormously helpful in planning to implement Limits in a way that maintains the spirit of the grant and [will] be deeply satisfying to our patrons. The guest speakers were fun, clearly good at their professions (education and marketing, for instance), and personable.

Figure 5
Librarian Competency to Plan, Coordinate, and Co-Facilitate PTL Programming



N=20

Note: Bars represent the percentages who responded *it generally prepared me or it prepared me very well*.

After completing all of the PTL programming in their libraries, all of the librarians (100%) reported that the materials and training provided had prepared them *quite a bit* or *a great deal* to plan, publicize, and co-facilitate the programming. Two commented specifically on how well the program prepared them to facilitate science-themed programming:

I believe the training materials provided by the PTL team in Portland were extremely helpful with my preparation for facilitating these events. I do have extensive experience facilitating arts and culture reading groups; however, PTL was the first time for my working with a science theme and facilitator.

I thought that the training and materials helped immensely. The training showed us how to present the materials to our audience in a way that would underscore the science in the materials without feeling threatening for those that shy away from science. The questions were prepared so well, that I didn't need any of my background materials that I brought in case.

Science Partner Webinar and Materials

The PTL team provided a webinar for the science partners as well as written material, including suggested discussion questions. Several of the partners commented on how helpful this material had been:

I didn't know what to expect! However with the prepared questions — with my modifications — I felt very comfortable facilitating the sessions.

I had very high expectations for this program and felt quite well prepared for it based on the electronic materials and webinar provided by the Limits team. I felt I was reasonably effective in my role as a science partner in the program.

I was well prepared with my background in anthropology and traditional foods. The best preparation came from the science partner webinar. That really helped me to understand the goals of the program, how to lead the discussion, and how to get ready.

HOW SUCCESSFUL WAS THE IMPLEMENTATION OF THE PTL PROGRAMMING?

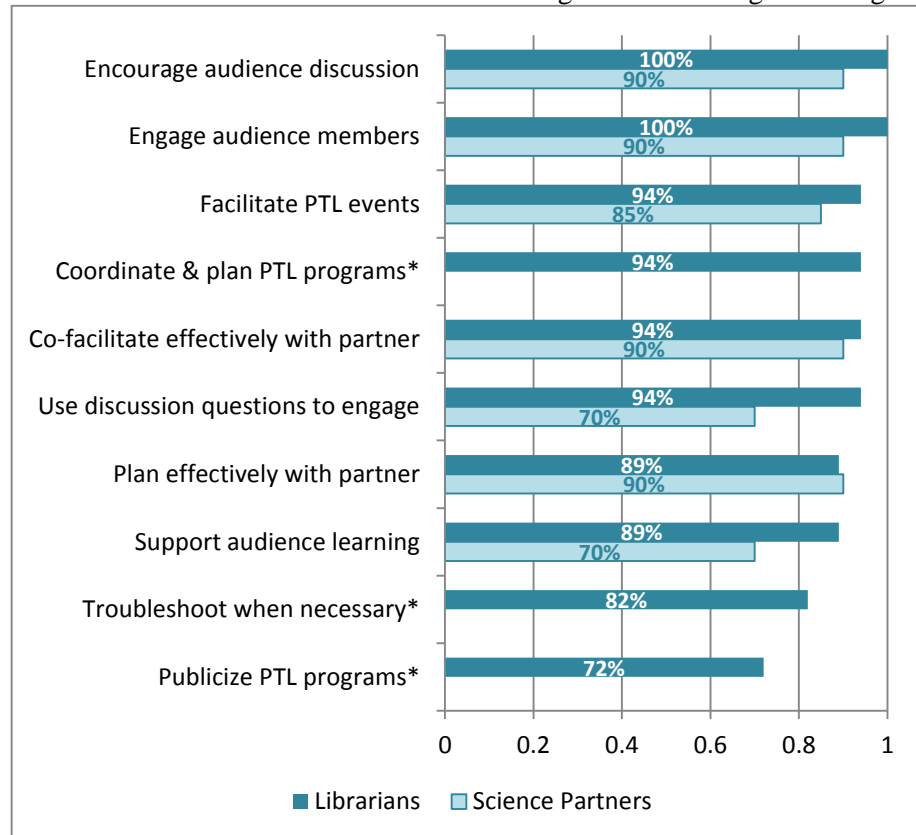
In this section, we present data from librarians, science partners, and library patrons on the success of the planning and facilitation of PTL programming, the degree to which the different program components successfully engaged attendees, and the extent to which librarians were able to draw a diverse audience of people who were not necessarily initially interested in science topics.

“[PTL] has opened opportunities for service to this community not being practiced...As a non-profit corporation, our lack of funds rarely allows a program of this quality and value to be presented from the library.”
-PTL Pilot Librarian

Success of Planning and Facilitation

Both librarians and science partners reported great success in planning the PTL programming, engaging their audiences, and facilitating lively discussions, as shown in Figure 6.

Figure 6
 Librarian and Science Partner Success Planning and Facilitating PTL Programs



N=17-18 librarians, 20 science partners

*Science partners were not asked the starred questions.

Note: Bars represent the percentages who responded *very successful* or *extremely successful*.

Although the majority of librarians (72%) were *very successful* or *extremely successful* in publicizing the PTL programming, others noted that they wished they had been able to reach more people and noted that promoting and publicizing the programming was time-consuming, especially for small libraries:

The promotional images and the ideas shared on the listserv were immensely helpful. Even so, the promotion took many hours of staff time.

The planning and promotion were very time consuming and might be difficult for other small libraries without strong volunteer help.

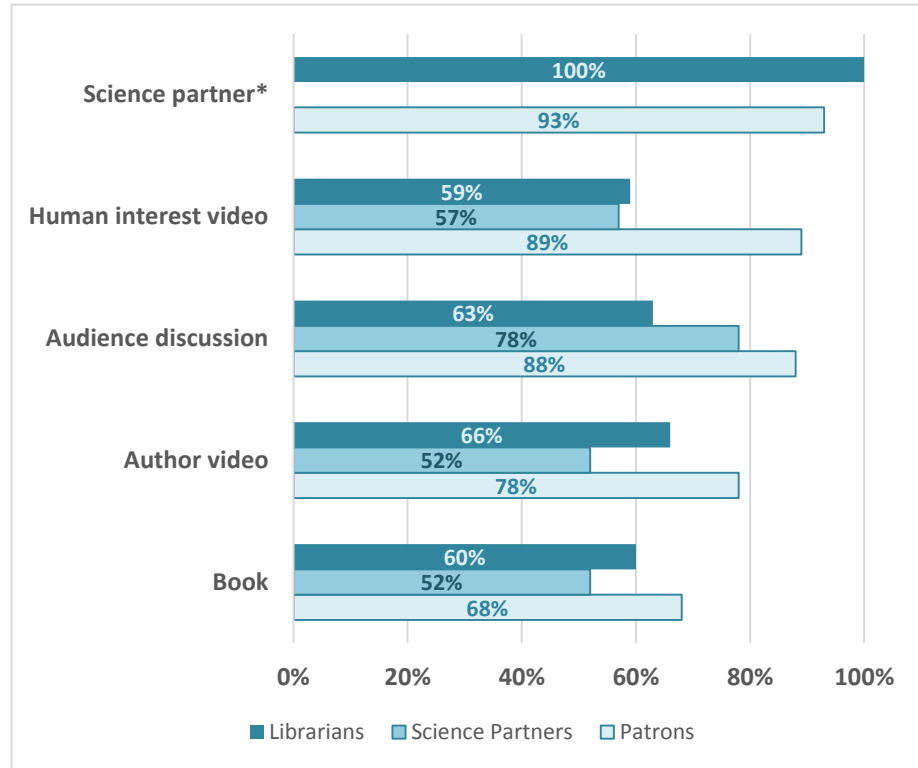
Success at Engaging Audiences

The librarians and science partners found that the PTL programming was very successful in engaging library patrons. One librarian discussed how the various components of the program worked to stimulate discussion:

I loved facilitating these programs! These programs weren't just typical library book discussions, analyzing the book and answering questions. These programs were topical discussions that invited adult attendees for an evening of broad-ranging adult conversation. The focus was on the topic, not the book. That is the key! The book was only one element of the discussion. Videos, articles, other books, personal experiences of attendees, and knowledge scholar input fed the discussion. The attendees and the knowledge scholar were intelligent, interesting, and interested in the topics. As the facilitator, all I had to do was to seed the discussion with a question now and then and make sure everyone had a chance to provide input.

Librarians thought the science partners were the most engaging component of the programming, and their patrons agreed, as shown in Figure 7 below.

Figure 7
Effectiveness of PTL Components at Engaging Audience



N=15-18 librarians, 12-16 science partners, and 53-69 patrons.

*Science partners were not asked the starred question.

Note: Bars represent the percentages who reported that the component was *very engaging* or *extremely engaging*.

The majority of respondents found the videos and the discussion engaging, and this was particularly true for the library patrons. As one librarian noted,

The video segments lent themselves to great discussions and back and forth conversations and question and answer periods during and after each segment.

All three groups agreed that the books were the least engaging component of the programming, but it is important to note that they were still rated as *very* or *extremely* engaging by more than half of all three groups of respondents. However, both librarians and science partners had specific complaints about the books. As one librarian said,

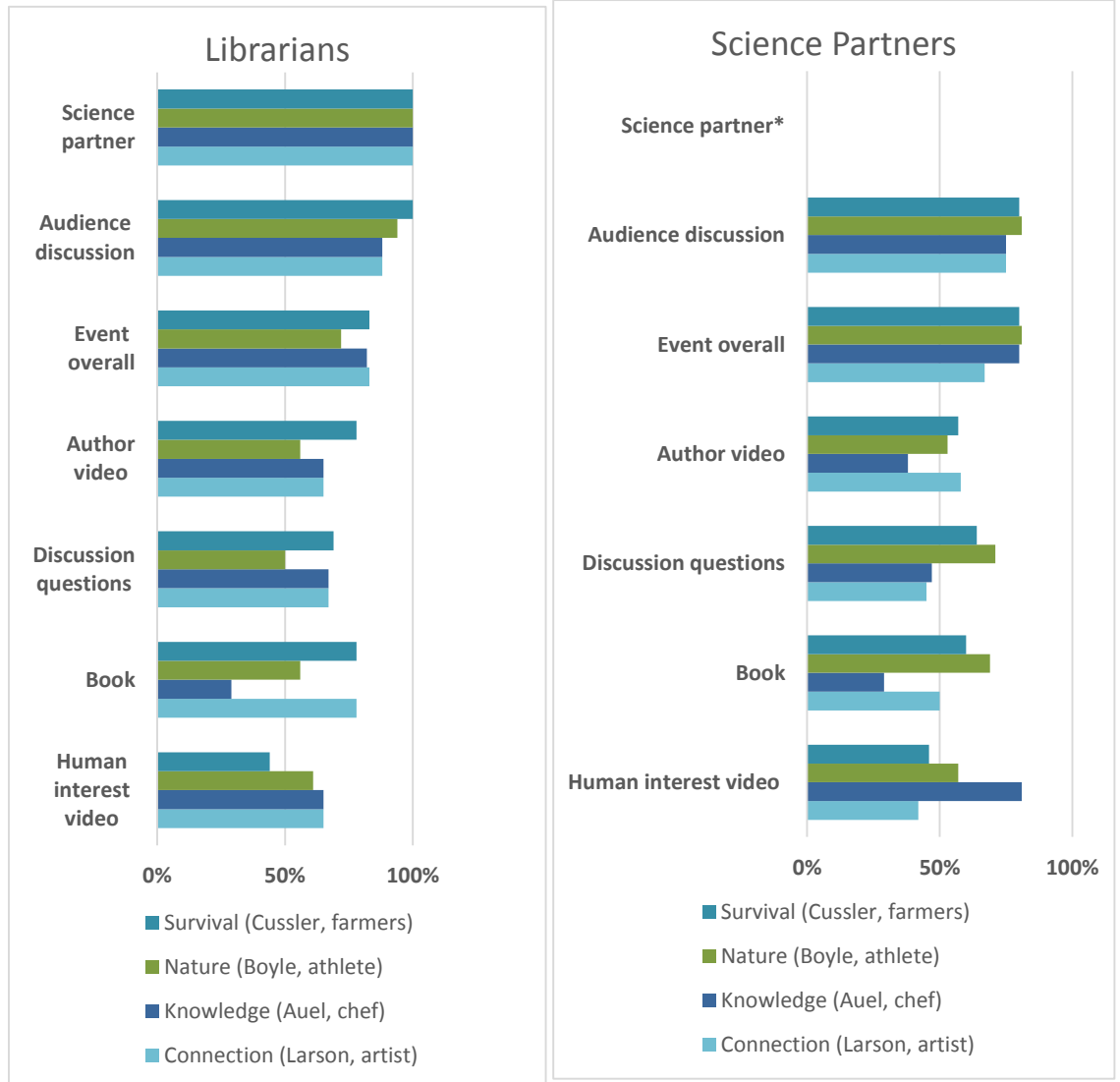
Choose better books with more science content...My science readers were not interested because there wasn't enough science, and my fiction readers weren't interested because the writing wasn't that good.

Several of the science partners were fairly critical of the book selections, primarily due to the amount and quality of the science content:

I don't think the books were the best out there to introduce science into a non-scientific community. Thunderstruck was probably the best out of the three books. Cussler was a close second. There were scientific themes through all the books, but they didn't always lend themselves to the best scientific discussions.

Librarians and science partners were also asked to make separate ratings of each of the four PTL programs; results are shown in Figure 8 below. There are a few differences between the ratings of the librarians and the science partners, but both groups give poor ratings to the Jean Auel book in particular.

Figure 8
Effectiveness of PTL Components at Engaging Audience for Each of the Four PTL Programs



N=15-18 librarians and 12-16 science partners.

*Science partners were not asked the starred question.

Note: Bars represent the percentages who reported that the component was *very engaging* or *extremely engaging*.

Success at Drawing Diverse Audiences

The PTL programming was successful in drawing a crowd that was not necessarily already interested in STEM topics. Asked to list the topics they were particularly interested in, just 29% mentioned a STEM topic, whereas 71% did not. In terms of expertise, a only a third (34%) described themselves as *very knowledgeable* or *extremely knowledgeable* about science, and just a quarter (26%) described themselves as similarly knowledgeable about math.

As one patron said,

I have enjoyed the series. These aren't the kinds of book I usually choose, so I was glad to push myself into a realm outside of my normal interests. [The science partner] has enhanced the experience with this well-prepared discussion.

Further, several librarians noted that the PTL events had drawn people who do not normally participate in book groups and in one case had drawn attendees from outside the community:

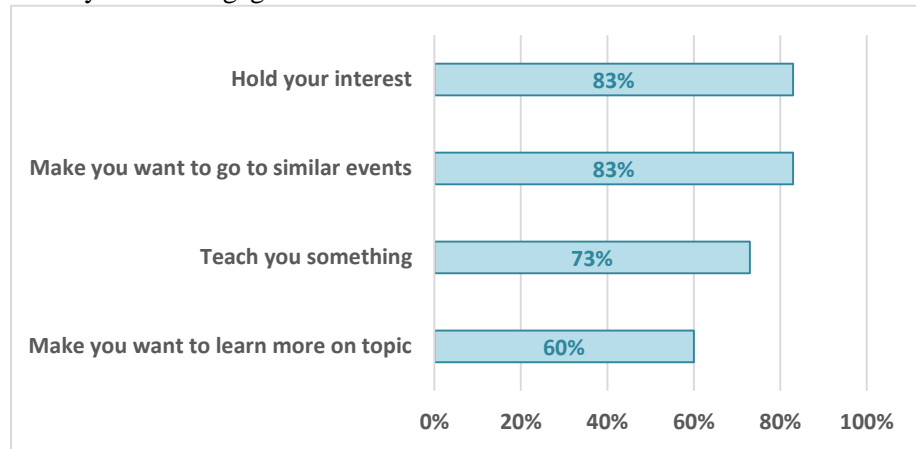
The programs brought people into the library — and into the community — who had never been here before.

WHAT WAS THE IMPACT OF THE PTL PROGRAMMING

Impact on Library Patrons

Library patrons at the five surveyed PTL events rated their engagement in the events extremely highly, especially in terms of holding their interest and making them want to attend other similar programming (see Figure 9).

Figure 9
Library Patron Engagement with PTL Event

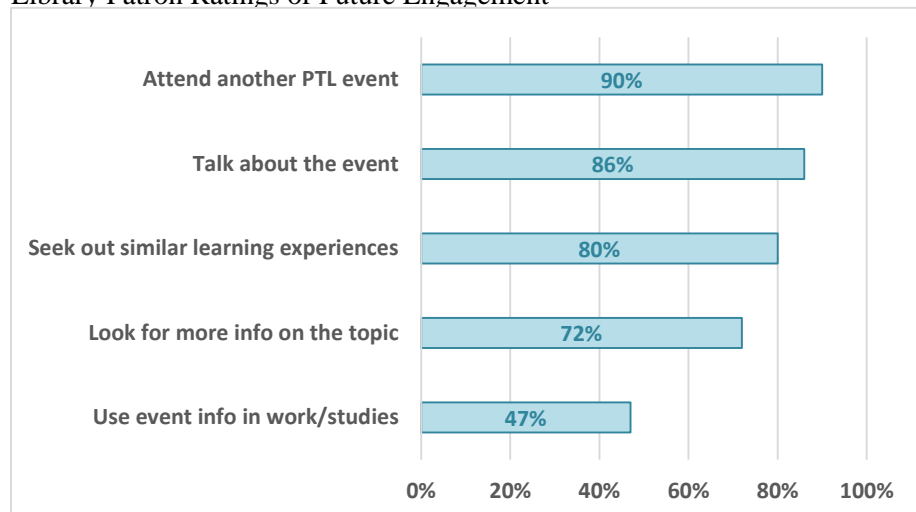


N=76

Note: Bars represent the percentages who responded *very effective* or *extremely effective*.

Similarly, these patrons also reported that the PTL event had piqued their interest in similar programming and topics, as shown in Figure 10 below.

Figure 10
Library Patron Ratings of Future Engagement

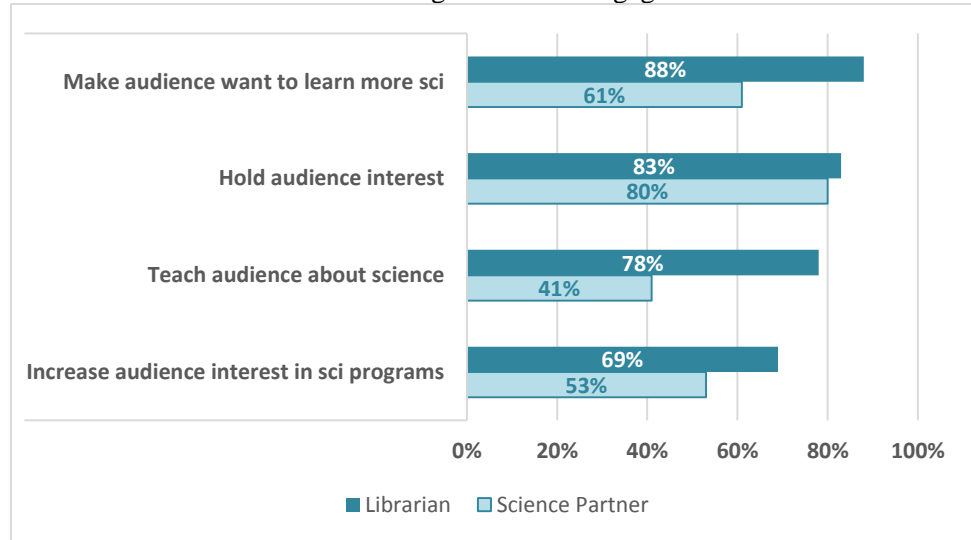


N=72-77

Note: Bars represent the percentages who responded *likely* or *very likely*.

Librarians and science partners were also asked about patron engagement, with more specific reference to their engagement with the science-related aspects of the programming (see Figure 11 below).²

Figure 11
Librarian and Science Partner Ratings of Patron Engagement



N=18 librarians and 20 science partners.

Note: Bars represent the percentages who responded *very effective* or *extremely effective*.

The librarians gave high ratings to both patron engagement and patron learning. For the science partners, while four to five out of ten rated the PTL programming as *very effective* or *extremely effective* in teaching and stimulating patron interest in science, they were somewhat less convinced than the librarians were that these aspects had been successful. Given the partners’ other comments about the science content of the books, it seems likely that they may have been stricter in their definitions of what constitutes science learning.

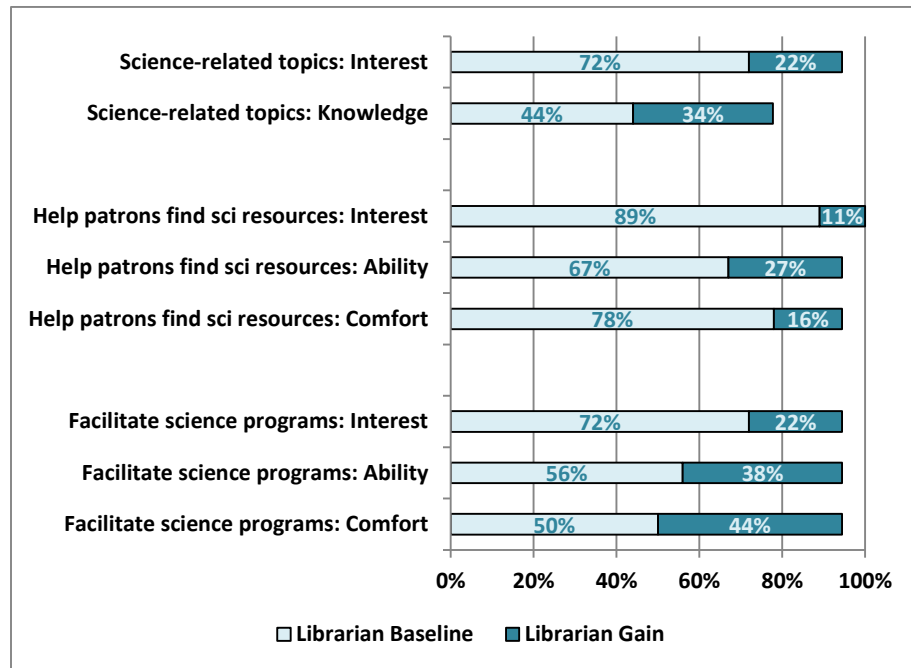
² The Limits team made the decision not to foreground the science aspects of the programming with library patrons in order not to alienate those who might not initially be interested in science. Therefore, the patron survey items did not make explicit mention of science.

Impact on Librarians

One of the primary goals of the PTL project was to increase the capacity of librarians at small and rural libraries to plan and facilitate science programming and to serve as ISE resources in their communities. As shown in Figure 12 below, the pilot PTL librarians made great strides, particularly in their comfort and ability in facilitating science programming. As one noted,

Most of the libraries in our area are afraid of the program. They worry that it will be too hard for someone with a non-science background. I've assured them that if we can be this successful, they can too.

Figure 12
 Librarian Gains in Interest, Ability, and Comfort as ISE Resources



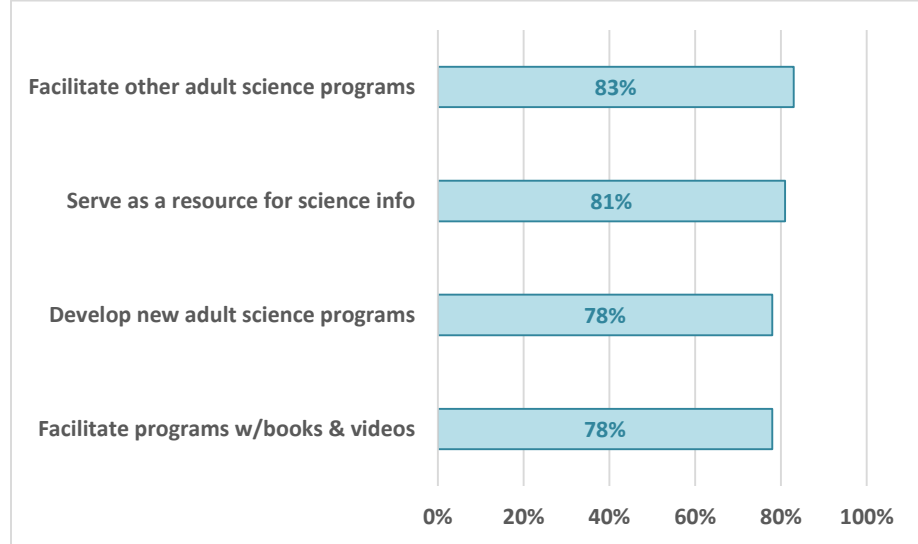
N=18-20

Note: Each bar represents post-programming ratings of *quite a bit* or *a great deal*. The lighter segment shows baseline ratings, while the darker segment shows gains from baseline to post-programming ratings.

The librarians also gained interest in facilitating science programming and were more confident in their science knowledge and their skills in helping patrons locate science resources, as well as in their own interest in science.

In terms of capacity building, the pilot librarians also reported gains in how well prepared they are to continue to present such programming (see Figure 13). Further, 78% of the librarians are *very likely* or *extremely likely* to continue facilitating adult science programming in their library.

Figure 13
Librarian Preparation to Present Future Science and Book/Video Programming



N=18

Note: Bars represent the percentages who responded that their PTL experience had prepared them *quite a bit* or *a great deal*.

These quantitative findings are supported by comments from a number of librarians about their plans to continue presenting science programming in their libraries in the future:

I am pleased that I was chosen to be a part of this pilot program and am sad that it is over. I hope that it is something that will be expanded upon...I know my participants would be back and so would my science partner. Thank you for all the support and guidance as we worked our way through this wonderful series of programs! I already plan to run the first two programs again for some that came late into the program.

Enthusiasm has been so high — my group has asked that I find a way to continue science-themed programs/book discussions starting again this fall. So I am now looking at ways to do this. It was too valuable an experience to let it be passive; I want to build on what we have successfully started. Thanks so very much!

Thank you very much for the opportunity to participate in Pushing the Limits. We had a great time organizing the program and enjoyed the excitement it brought to our community. After

the fourth and final program, participants were left wanting more and we hope to continue offering such programming.

This has been a phenomenal experience. We did not attract as large an audience as I hoped, but we had great conversation — such that we will be doing more as a result of this program, both with science and otherwise.

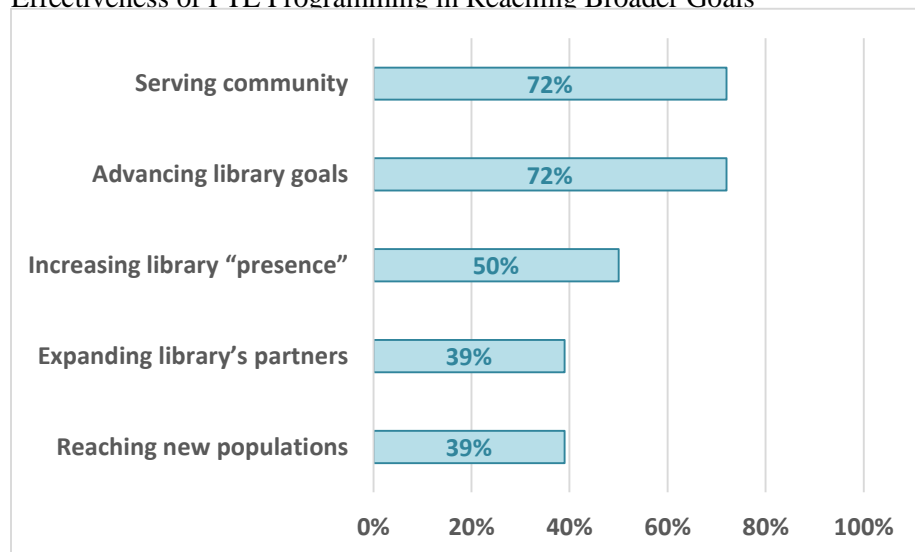
I offered other programs at the same time on [PTL-]related topics which drew good attendance. These programs were on topics that I wouldn't normally consider, so I'm going to try to pay more attention to variety in my programming in future.

"I feel so fortunate to have participated in this series of programs. They can be life changing, relationship building, exciting events. I had to spend a day afterwards just unwinding from the experience! Many thanks!!!"

-PTL Pilot Librarian

Finally, the librarians also gave high ratings to the PTL programming in terms of broader goals, particularly serving their communities and advancing library goals (see Figure 14).

Figure 14
Effectiveness of PTL Programming in Reaching Broader Goals



N=18

Note: Bars represent the percentages who responded *very effective* or *extremely effective*.

Impact on Science Partners

The science partners were not the primary target audience for the PTL program. Nonetheless, there was evidence of some impact on them. Most (90%) reported that, based on their experience with PTL, they are *very likely* or *extremely likely* to continue their involvement with public science programming. Further, as noted above, the science partners were already quite confident in their ability and comfort in facilitating public science programming before PTL began, leaving little room for further gains (see Figure 3 above). Nonetheless, there was a gain of 11% in the number of science partners who report *quite a bit* or *a great deal* of interest in facilitating public science programming.

HOW COULD THE PTL PROGRAM BE IMPROVED?

Data from librarians, science partners, and library patrons converge to demonstrate that the pilot PTL program was quite successful. Many respondents had no suggestions for improving the program, but among those who did, suggestions clustered into several common themes.

Book Selection

Librarians, science partners, and library patrons all made suggestions about the books, primarily that they be shorter, contain more science content, and be better written.

It was a great program but would probably get more participants with shorter books. Often our patrons aren't just science averse, but avoid reading also.

In general, librarians and science partners would like greater freedom in selecting books designed to appeal to patrons in their communities:

Maybe a selection of books that the science partner and librarian could choose from that might interest their membership more. The librarian that I worked with is very knowledgeable about what the patrons' likes and dislikes were.

Several librarians and science partners expressed their willingness to provide specific book suggestions; for example:

I would like to see future book selections that have a little stronger science component to them. Some suggestions I could offer are: Amanda Ripley's "The Unthinkable: Who Survives When Disaster Strikes and Why"; Ariana Franklin's "Mistress of the Art of Death"; Dava Sobel's "Galileo's Daughter"; Mary Roach's "Stiff"; Oliver Sacks' "Uncle Tungsten"; Ross King's "Brunelleschi's Dome."

Our science partner was not a big fan of "The Land of Painted Caves" for Knowledge. He suggested a dozen or more other titles, the top three being: "Hyperspace, Our Final Frontier," by J. Gribbin; "A More Perfect Heaven: How Copernicus Revolutionized the Cosmos," by D. Sobel; and "Undaunted Courage," by S.E. Ambrose.

As noted by one librarian, however, groups could have excellent discussions even when they didn't like the books:

People did not always enjoy the chosen books, but there was never a lack of rich discussions. The books as a starting point

works very well; but the conversations that resulted were amazing.

Videos

Both librarians and science partners noted that the videos were engaging and successful at triggering discussion:

The videos of ordinary folks applying technology in various ways was a very strong part of this series. These short films really spurred discussions effectively. (PTL Librarian)

The video segments were a very good thing. They gave us something to organize the discussion around, which was very useful. (PTL Science Partner)

Several respondents mentioned emphasizing the videos more heavily, and one librarian wondered if the books were strictly necessary:

Our community has never been much for book clubs, but the videos were really successful here. Have you considered designing some programs just around the videos?

Marketing and Promotion

The most common suggestion offered by patrons was to have more and better publicity and advertising to attract a larger, wider audience to what they felt was an excellent program. Some librarians also mentioned that they could have used more assistance with promotion and marketing, especially to attract younger patrons.

Marketing was still the hardest part; some of what I did worked out wonderfully, some not as much.

I'm not sure the attendees at my library were the ones you hoped to target with this series of programs...many of our attendees were retired or nearing retirement, most were over 60, many had worked in a science-related field, all of them appreciated the opportunity to have intelligent, adult discussion on a topic that was not limited to the content of a book.

Library Support

A few librarians mentioned that they would like to have had materials and information further in advance; for example,

Please provide information in a timely manner, at least two months in advance of any planning the libraries need to do. I felt as though my ability to do my job effectively was hindered by waiting for information and materials

Another suggested providing more opportunities for ongoing exchanges among the participating libraries, even after the

Maybe on ongoing exchange of ideas on the listserv. We are continuing, thanks to the generosity of our facilitator [science partner], and it would be nice to keep sharing “best of” ideas for new folks.

UPCOMING EVALUATION ACTIVITIES

During Year 4 of the evaluation, GRG plans to continue conducting the summative evaluation of the 75 rollout libraries. The summative evaluation will assess the effectiveness of the project in meeting its goals for the librarians at rural and small libraries, their patrons, and their science partners. Instruments from the second formative evaluation will be revised as necessary to be used in the summative evaluation.

The summative evaluation will be guided by the following questions:

- Does project participation increase librarians' identification of themselves as science resources in their communities and as facilitators of public science programming?
- How effective is the project's PD model via distance (i.e., web-based) education?
- Does community event participation increase rural adults' interest in and knowledge of science and their motivation to learn more about science and attend science-related free-choice learning?

Librarians will complete a web-based professional development program starting in September 2013. PTL programming in the 75 libraries will begin in February 2014 and be completed no later than July 2014. Evaluation activities include the following:

1. Librarians (n=75) will take two online surveys, one at baseline, before the PD, and a second shortly after they complete their final PTL event.
 - a. The baseline survey was administered in August 2012 with a response rate of 91%.
 - b. The post-programming survey will be administered on a rolling basis as each library finishes all its PTL programming (April-July 2014).
2. Science partners (n=75+³) will take an online retrospective survey shortly after they have finished co-facilitating their final PTL event (April-July 2014).
3. Library patrons will take brief paper surveys at a random sample of 20 libraries after the first and last PTL event held at that library.
 - a. The first-event survey will be administered on a rolling basis as each selected library holds its first PTL event (February-April 2014).
 - b. The last-event survey will be administered as each selected library holds its final PTL event (April-July 2014).
4. GRG staff or field researchers will observe one PTL event at each of 10 libraries (February-July 2014).

³ Some librarians in the pilot program selected multiple science partners, depending on the topic and the partner's expertise and availability. However, most worked with the same science partner for all four PTL programs.

LIST OF APPENDICES

A: PTL PROGRAM DATES AT PILOT LIBRARIES

B: ANNOTATED LIBRARIAN BACKGROUND SURVEY

C: ANNOTATED SCIENCE PARTNER BACKGROUND SURVEY

D: ANNOTATED LIBRARIAN PROFESSIONAL DEVELOPMENT SURVEY

E: ANNOTATED LIBRARIAN POST-PROGRAMMING SURVEY

F: ANNOTATED SCIENCE PARTNER POST-PROGRAMMING SURVEY

G: ANNOTATED PATRON POST-EVENT SURVEY

Goodman Research Group, Inc.

Main Office

929 Massachusetts Avenue, Suite 02A
Cambridge, Massachusetts 02139

Tel: (617) 491-7033

Fax: (617) 864-2399

info@rginc.com

www.rginc.com

© 2013 Goodman Research Group, Inc.

Appendix A
PTL Program Dates at Pilot Libraries in 2013

	<i>1st event</i>	<i>2nd event</i>	<i>3rd event</i>	<i>4th event</i>
Bertha Voyer Memorial Library	Nature 1/24	Connection 2/28	Survival 4/4	Knowledge 5/2
Cross Plains Public Library	Nature 1/17	Survival 2/21	Connection 4/4	Knowledge 5/23
Fairfield Library Association, Inc.	Connection 2/26	Nature 3/25	Knowledge 4/25	Survival 5/30
Flenniken Public Library	Survival 3/6	Connection 4/3	Knowledge 5/1	Nature 6/5
Greenwich Free Library	Survival 3/13	Nature 4/6	Knowledge 5/25	Connection 6/19
Galway Public Library	Nature 3/25	Survival 4/22	Connection 5/20	Knowledge 6/24
Georgetown County Library*†	Nature 2/1*	Survival 3/1	Connection 4/5†	Knowledge 5/3
Gustine Branch Library*†	Nature 1/29*	Connection 2/26	Survival 3/26	Knowledge 4/23†
Howe Library	Connection 2/7	Survival 3/7	Knowledge 4/4	Nature 5/2
Imperial County Free Library†	Nature 2/28	Survival 3/14	Connection 4/10†	Knowledge 5/8
Independence Public Library	Survival 3/14	Nature 4/18	Connection 5/9	Knowledge 6/13
Little Priest Tribal College Library	Nature 2/25	Survival 3/26	Connection 4/22	Knowledge 6/17
Mammoth Public Library	Connection 2/5	Nature 2/19	Knowledge 3/5	Survival 3/19
Mark & Emily Turner Memorial Library	Nature 1/24	Survival 5/7	Connection 6/4	Knowledge x/xx
Richfield Public Library*†	Connection 1/31*	Survival 2/21	Knowledge 3/21	Nature 4/18†
Sedro-Woolley Public Library	Nature 2/19	Survival 3/19	Connection 4/16	Knowledge 5/21
Stair Public Library†	Connection 2/28	Nature 3/28	Survival 4/25†	Knowledge 5/30
Sterling Public Library	Nature 3/26	Survival 4/23	Knowledge 5/30	Connection 6/25
Westmoreland: Murrysville Library	Nature 3/26	Connection 4/22	Survival 5/29	Knowledge 6/24
Westmoreland: Sewickley Township Library	Nature 3/25	Connection 4/23	Survival 5/21	Knowledge 6/25

* Filmed for web-based PD

† Patron surveys

APPENDIX B
Pushing the Limits
Librarians: Background Survey

1. How many staff (excluding volunteers) are employed at your library?

	Mean	Median	Range
Full Time	3.35	2.00	0-18
Part Time	5.50	3.50	0-26

N=18

2. How many volunteers do you have at your library?

Mean	Median	Range
14.60	6.50	0-106

N=20

3. How would you describe your library's resources about topics related to science, technology, engineering, and math?

Mean (1-5)	Poor (1)	Fair (2)	Good (3)	Very Good (4)	Excellent (5)
2.65	1	8	8	3	–

N=20

4. For how many years have you been employed as a librarian?

Mean	Median	Range
16.50	14.50	2-75

N=20

5. In the last two years, in about how many professional development programs for librarians have you participated?

Mean (1-5)	None (1)	1-2 (2)	3-5 (3)	More than 5 (4)
3.50	–	2	6	12

N=20

6. In the last two years, about how many adult public programs have you run at your library?

Mean (1-5)	None (1)	1-2 (2)	3-5 (3)	6-10 (4)	More than 10 (5)
4.45	–	–	2	7	11

N=20

7. Have you ever done any adult public programming integrating books and videos?

	N
Yes	7
No	13

N=20

If yes, please describe:

- Adult book discussion, watching a video to set the stage for the topic and provide information not contained in the book, then discussion of the book. This worked well and patrons enjoyed it.
- Quarterly Adult Book to Movie events both fiction and non-fiction.
- We have a Book/Movie Club that integrates a book discussion along with an accompanying movie on either VHS or DVD. We have had this program 2 years.
- We have used documentary video footage to compliment readings.
- In the 1980s, I was the director of a different rural public library. At that time we received a grant from the Arizona Humanities Council to have a scholar present short story films and lead discussions afterwards.
- Let’s Talk About It Series.

8. Have you ever done any adult public programming in partnership with another non-librarian professional in your community?

	N
Yes	17
No	3

N=20

If yes, please describe:

[*Click here to see a complete list of responses.*](#)

9. Have you ever done any adult public programming focusing specifically on science?

	N
Yes	7
No	13

N=20

If yes, please describe:

- Rocket Boys/October Sky Book to Movie Event.
- As part of the Michigan Notable Books program, we hosted author Steve Lehto (‘Chrysler’s Turbine Car’) and one of the high school science classes displayed and demonstrated their inventions following the program. Several patrons brought in artifacts for display such as an original Chrysler turbine, blueprint drawings of the Chrysler turbine development, related photographs, etc. Several engineers attended the program and added their knowledge to the author’s presentation.
We’ve had programs that have a science bent to them, such as a nature photography art exhibit with photographers explaining their work, and author Tom Springer, “Looking for Hickories,” talking about his essays on nature, but not an adult program where our main focus was science. (We’ve done lots more science specific programs with kids, though).
- As part of this year’s community read, I am planning a presentation by two professors (one from University of New Hampshire, the other from Dartmouth) on their research on the ocean and on human impact on the ocean. We’re also hosting Dr. Donald Perovich from the Cold Regions Research and Engineering Laboratory — a leading researcher on the Arctic — to talk about his research, the Arctic, and climate change.
- Research Revolution was a film viewing and discussion series on science related topics. The films were: Into the body; Who gets to know? Genetics and privacy; What’s up with the weather?; Gene squad, DNA profiling; I am Become Death, they made the bomb; and Natural Connections.
- Our Astronomy Day program featured learning about exploration and imaging of Mars, followed by observations through telescopes.
- Four of the six programs during the Discover Earth exhibit:
 - ‘Connecting Children with Nature’
 - ‘Raptors in Nebraska’
 - ‘Recognizing and Restoring What We Have: The Nature Conservancy’s Efforts along the Missouri River’
 - ‘Nebraska Animals,’ outreach from the Henry Doorly Zoo
- Environmental and self- health.

10. At this time, how would you describe:

	Mean (1-5)	None (1)	Only a little (2)	Some (3)	Quite a bit (4)	A great deal (5)
...your personal interest in science-related topics?	4.05	–	2	3	7	8
...your personal knowledge of science-related topics?	3.35	–	4	8	5	3
...your interest in helping adult patrons find resources on science-related topics?	4.55	–	–	2	5	13
...your ability to help adult patrons find resources on science-related topics?	4.00	–	–	6	8	6
...your comfort with helping adult patrons find resources on science-related topics?	4.15	–	–	5	7	8
...your interest in facilitating adult programming on science-related topics?	4.10	–	–	6	6	8
...your ability to facilitate adult programming on science-related topics?	3.60	–	2	7	8	3
...your comfort with facilitating adult programming on science-related topics?	3.65	–	1	9	6	4

N=20

11. Are you:

	N
Female	17
Male	3

N=20

12. Which of the following categories best describe your race/ethnicity?

	N
American Indian or Alaska Native	–
Asian	1
Black or African American	–
Native Hawaiian or other Pacific Islander	–
Hispanic or Latino	–
White	18
Other; please specify	1

N=19

Note: Responses exceed 19 because respondents could select more than one response.

13. What is the highest level of education you have completed?

	N
High school diploma or the equivalent (GED)	–
Some college or associate’s degree	3
Associate degree(s)	–
Bachelor’s degree(s)	–
Some graduate school	–
Master’s degree(s)	3
Professional degree(s) (e.g., MD, DDS, DVM, LLB, JD, DD)	12
Doctorate degree(s) (e.g., Ph.D., Ed.D.)	–
Other; please specify	2

N=20

Other responses include “I have both a Master’s (MA in English) and a professional degree (MSI — Master of Science in Information — equivalent to the MLS/MLIS)” and “Teaching certificates.”

14. Is there anything else you’d like to share with us at this time?

- I’m excited about this grant! I think that science programming can be harder to put together if a good presenter doesn’t just offer himself/herself, so I’m looking forward to getting some ideas and training in this area.
- We are very happy to be participating in this project. It should definitely help us in stimulating local citizens to know more about science.
- I think science is fun and exciting; am looking forward to this grant. Thank-you!
- I desire to spread and share scientific knowledge and applications to our community. I seek resource and methods to promote this subject for education and appropriate application of scientific advantages for this community.
- I feel very fortunate to be a Branch Manager in a regional library for the past 21 years! It is a job I love and am passionate about! This program allows me to share my love of Science and share it with others in a fun way!! I have already been talking about the upcoming program and getting patrons interested and fired up to participate in this program! I am so forward to learn the nuts and bolts of this project! Thank you for allowing me this opportunity to be a part if this ground-breaking series.
- My background is in technology, I was a computer technical professional for over 30 years, working for a software company, a public utility, the railroad, and a school district. I found my second career as a librarian in a small south-east Kansas town. I am the new Public Services Manager at our library. My husband has a BSEE with a Masters in Ecology & Evolution, he worked as a technical planner for a public utility and also made a living as a multivariate statistician. We have many interesting conversations on STEM related topics! I was an early adopter on the internet and love to do research. I am also a professional photographer.
- I modulated my responses to the questions about interest, knowledge and ability of facilitating adult programming on science-related topics because I wasn’t sure if you were talking coordinating the programs or being a discussion facilitator. I’m nervous about actually facilitating a discussion of science topics...(I’m assuming that is what the science scholar is going to do)...but I have a great deal of knowledge and ability to coordinate programs. I know I should have called to clarify before completing this survey, but it’s late and I need to get it done.

- Our science collection is only fair, not because I cannot find out about excellent resources and promote them, but because we do not have money and also because there has only been limited interest. My hope is this program will generate more interest!

Full Text of Open-Ended Responses

15. Have you ever done any adult public programming in partnership with another non-librarian professional in your community?

- Outreach programs.
- Adult G.E.D. classes with Abilene ISD.
- We involve community groups and individuals in one way or another in most of our programming, but we don't exactly share the billing with other groups as we do, for example, with the Michigan Humanities Council for our Prime Time Family Reading Time program. I'm not sure if this is what you are looking for, but I'll list a variety of our activities and what we consider 'partnering.'
 - Living Library (now the Human Library): partnered with the high school AP English teacher (her class studied stereotyping and came up with descriptions of people who are stereotyped which we used in creating a 'catalog' of books for the event).
 - Art exhibits: high school art teacher coordinated Community Art Exhibit at the library when we hosted the Smithsonian Institution 'Barn Again!' exhibit. (We continue to coordinate many exhibits with the art teacher.)
 - Michigan Notable Book author visits: When we host authors we usually plan activities and events related to the topic of their book. We have partnered with the schools to provide art exhibits, and for one event, science projects; with community members to provide refreshments or items to display (e.g. genealogy items, football memorabilia).
 - We partner with the Barnes & Noble bookstore to sell books at the events. We arrange for coverage with local newspapers.
- Many of our programs are offered in partnership with community groups. We do combination book discussion/art exhibit tours with the local art museum; we recently offered a communal reading of 'The Tempest' cosponsored with Dartmouth's arts center (which was hosting a dance performance based on the play); we offer annual events with a local literary magazine and with local 'Friends of the Appalachian Trail' groups. Other groups with which we have partnered include the League of Women Voters, the local chapter of the Audubon Society, a local sustainability group, the Center for Cartoon Studies, and the local historical society. I've also worked with Dartmouth College professors to design programs that they have then led. There have probably been more, but that's what I can remember off of the top of my head!
- I have scheduled the following adult programs with non-librarian professionals: Local author book discussions in which local authors come in and have book discussions about their books; Socrates Cafe in which individuals talk about current events and controversial topics; Local history events which local historians come in and discuss local history; a UFO lecture which was presented by UFO researcher; Research Revolution, a film viewing and discussion series on science topics.
- Many types: dance, art, history, etc.
- We have had several local authors speak. We have also had computer classes and groups that have met to discuss weight loss and healthy eating.
- We have done several programs with the BBB and police department on identity theft and online safety.
- The latest project was a Small Business grant that we initiated for collection development, plus we have partnered with our local Economic Development Association to offer programming for small business start-up & development.
- Local Agri office, Master Gardeners, Master Naturalists, Area Forestry rep.
- Presentation of subjects; i.e. library long term planning, hazards of poisons, nutrition program through Ag-Life. Adult search; education, job, employer training, employer/educational testing, reference searches, genealogical, general reference.

- Programs on nutrition, health, history.
- We have held wormshops (workshops teaching how to raise worms) with Linda Leigh, Astronomy Day with staff from the HiRISE program and an amateur astronomer from a neighboring community, a breastfeeding program with the local clinic, etc. These professionals were not from our community, per se, but our two neighboring communities along with us are considered a tri-community area. We share many resources and programs (although we each have our own separate library).
- I encourage arts and science community professionals to hold programs in both fields at our library.
- Local hospital, university, homeless shelter, and department of human services.
- Discover Utah program involved park rangers or other federal and state employees who were acquainted with Utah.

[Click here to return to the annotated survey.](#)

APPENDIX C
Pushing the Limits
Science Partners: Background Survey

- 1. Please tell us a little about why you volunteered to participate in the “Pushing the Limits” program — your motivations for participating, the background that you felt prepared you for this task, and your previous experiences.**

Common responses:

- Experience in teaching or background in education
- Experience as a facilitator, presenter or discussion leader
- Desire to help the library and surrounding community
- Passionate about science
- Interested in ecology and the environment
- Want to bring science to non-scientific populations
- Connect science to the humanities and everyday life

[Click here to see a complete list of responses.](#)

- 2. Before participating in the “Pushing the Limits” program, had you ever been involved in any public science programming for adults; e.g. science cafés, science festivals, etc.**

	N
Yes	14
No	7

N=21

If yes, please describe:

- Scientific presentations and health and wellness lectures for country employees and K-12 schools.
- Science fairs; developed and presented public programs on horticulture and nature topics.
- Scientific illustration workshops; botany workshops; science-oriented lectures.
- Science cafes, workshops on minimizing garbage using worms, numerous public presentations about Biosphere 2.
- For several years I chaired the committee for the central Utah Natural Resources Festival, a 3-day annual educational event to educate students and the public about Utah’s natural resources.
- Educational programs offered by the Texas Master Naturalist program.
- I was also the Career and Technology Education director and was to make sure that all CATE teachers were well aware of STEM and used this in the classroom. I am currently a Master Naturalist and do on-going training to adults regarding science and/or nature.
- Public Chemistry Demonstrations-for many years.
- Astronomy in the Mall with Pacific Science Center.
- Workshops, symposiums.
- Electric Industry Symposiums.
- Public lectures, public presentations of science media; director, writer for science videos for the public and teachers.
- See above. NSF’s ‘Research Revolution: Science and the Shaping of Modern Life.’
- See above under Previous Experience.

3. At this time, how would you describe:

	Mean (1-5)	None (1)	Only a little (2)	Some (3)	Quite a bit (4)	A great deal (5)
...your comfort with working in informal learning environments (i.e., non-school settings)	4.57	–	–	1	7	13
...your interest in helping people in your community understand science-related topics?	4.67	–	–	2	3	16
...your ability to help people in your community understand science-related topics?	4.43	–	–	–	12	9
...your comfort with helping people in your community understand science-related topics?	4.48	–	–	1	9	11
...your interest in facilitating public programming on science-related topics?	4.67	–	–	–	7	14
...your ability to facilitate public programming on science-related topics?	4.43	–	–	–	12	9
...your comfort with facilitating public programming on science-related topics?	4.48	–	–	1	9	11

N=21

4. Are you:

	N
Female	7
Male	14

N=21

5. In what year were you born?

	N
1980-1989 (aged 30)	1
1970-1979 (aged 38)	1
1960-1969 (ages 44-53)	10
1950-1959 (ages 60-63)	3
1940-1949 (ages 70-73)	4
1930-1939 (ages 74-79)	2

N=21

6. Which of the following categories best describe your race/ethnicity?

	N
American Indian or Alaska Native	2
Asian	–
Black or African American	–
Native Hawaiian or Other Pacific Islander	–
Hispanic or Latino	–
White	21
Other; please specify	–

N=21

Note: Responses exceed 21 because respondents could select more than one response.

7. What is the highest level of education you have completed?

	N
High school diploma or the equivalent (GED)	–
Some college	–
Associate degree(s)	–
Bachelor's degree(s)	2
Some graduate school	3
Master's degree(s)	8
Professional degree(s) (e.g., MD, DDS, DVM, LLB, JD, DD)	1
Doctorate degree(s) (e.g., Ph.D., Ed.D.)	6
Other	1

N=21

Other (N=1):

- Currently pursuing my PhD

Full Text of Open-Ended Responses

8. Please tell us a little about why you volunteered to participate in the “Pushing the Limits” program — your motivations for participating, the background that you felt prepared you for this task, and your previous experiences.

- I have a BS in Forestry from the University of Michigan. I am pursuing my master’s degree at Stephen F Austin State University in Nacogdoches, TX. I have been a part of the Texas Master Naturalists since 2007 and frequently teach courses on forest ecology and management as well as entomology. My motivation for being a part of this program is to encourage open discussion on environmental issues within the non-scientific community.
- I was asked by Linda Fields as I was a polished presenter and discussion leader who has done numerous programs through the Utah Humanities Council as well as taught high school English and journalism for 25 years. Linda had heard me present at the Richfield Library and also wrote an endorsement for my book, *The Sum of Our Past: Revisiting Pioneer Women*, published in 2004. Much of the research was through a NEH grant.
I wanted to participate because I am respected in the community for my teaching abilities and felt I could motivate those attending to deeper thoughts about a book and the theme(s). Also my husband was a science teacher for 15 years and values the connection between science and the humanities.
We talk about issues much of the time.
- I have no previous experience volunteering or working with libraries in the area. My motivation is that I love science and scientific discovery, including sharing my passion for learning and appreciating science. As a child I used lots of Styrofoam cups, tape, pop sickle sticks, glue, paper, etc. making my scientific experiments. My parents bought us the Charlie Brown Encyclopedia set and always found time to take us to the library to pick up a few books. I have very fond memories of science and reading as a child and only hope that I can pass that along to the younger generation. My background in science started early, but my professional training continued in school. I had great math and science teachers throughout high school and college. After graduating with a degree in Exercise Science-Pre Physical Therapy, I attended graduate school and obtained a Master’s and Doctorate in Kinesiology. My Master’s thesis was on genetic factors that influence blood clotting protein response during exercise/exertion. My dissertation measured blood clotting protein adaptations to cardiac rehab therapy in cardiovascular diseased patients. I teach several human physiology-based courses at Adrian College and conduct several research studies with students.
- Let’s start with some disclosure — My wife is a librarian working on this project. Although the above probably helped with me getting selected for this, I volunteered because I have a love of science. I enjoy discussing topics and enjoy hearing what others have to say. I enjoy seeing science translated so it’s understandable by everyone.
My Background: I have a degree in Chemical Engineering from Cornell University. I am a LEED AP (Leadership in Energy and Environmental Design Accredited Professional). I was a Nuclear Reactor Operator on a Submarine.
- I volunteered because I like the thought of getting communities more involved in discussing science and seeing how science is actually around us in everything we do every day both in fantastic and exciting ways and simple more mundane ways.
My background is in education. I have been a teacher for 5 going on 6 years. I also enjoy taking complicated science ideas and using everyday examples to explain them. Especially to people who usually don’t stop and think about the science behind those things.
- I was asked by our librarian to become part of the project. Mary and I have worked on a couple of other Science/Library related projects and we work well together. I am currently the Environmental Science Instructor at LPTC. I have also taught Horticulture at a community

college and I was a Naturalist for several years. I also enjoy reading and have previously read 2 of the 4 books for this project.

- Charles B. Greenberg CV

Charles B. Greenberg earned his Ph.D. in materials engineering in 1965 from the University of Illinois, Urbana-Champaign campus, with a minor in chemistry. He received a Master of Science degree in materials engineering in 1962 at the same campus, and his Bachelor of Science degree in materials science in 1961 at Rutgers University. During his academic career, he held several fellowships/scholarships.

Dr. Greenberg was employed with PPG Industries, Inc. from 1965 to 2002 at the Glass Technology Center outside of Pittsburgh, PA. He retired from PPG with the titles Corporate Fellow and Manager/Flat Glass New Product Development. Dr. Greenberg's areas of scientific expertise include: (a) thin films for solar and thermal control; (b) glass science and technology; (c) chemical vapor deposition (CVD) and spray pyrolysis; (d) electroless films and chemistry; (e) electrochromic, thermochromic and photochromic (switchable) films; (f) photocatalysis and self-cleaning films. He has authored or co-authored 21 scientific articles, three invited, and has 25 U.S. patents.

Dr. Greenberg has been a Distinguished Colleague of PPG's Collegium since 1988, denoting critical contribution to key commercial developments, and was Collegium President from 1992 to 1994. He was one of the recipients of PPG's President's Award in 1989 for the development of SOLARCOOL® glass.

Because of Dr. Greenberg's special interest in science education for K-12 children, he was, from 2001 to 2007, on the Steering Council of the Math & Science Collaborative, Allegheny Intermediate Unit 3, and has served as a resource to Pittsburgh Public Schools. He wrote invited essays on science education for three editions of the Math & Science Collaborative Journal (annual volumes issuing in 2003 – 2005). He worked on a special project with Pittsburgh Regional Center for Science Teachers (PRCST), an outreach of the University of Pittsburgh School of Education. The project was based on the national 2003-06 bicentennial commemoration of the Lewis and Clark Expedition. He retired in 2005 from the Board of Directors of PRCST, after completing work as principal author, editor and manager for its Lewis and Clark web site. The PRCST web site address is <http://www.education.pitt.edu/lewisandclarkpgh>.

Also, Dr. Greenberg has been a category judge for more than 12 years for the Pittsburgh Regional Science & Engineering Fair, administered by the Carnegie Science Center. He has been co-chair of the Senior Chemistry Category and a member of the Science Review Committee since 2008. He was also Chemistry Category co-chair for the International Science & Engineering Fair in 2012. Dr. Greenberg was as well a Speaker/Scholar in 2003 for the national, NSF-funded, ALA-sponsored science outreach program called Research Revolution. In 2006-07, he continued the program under sponsorship of the Westmoreland County Federated Library System (WCFLS). He presented the full program series at Monroeville Public Library in 2011, and the University of Pittsburgh Osher Lifelong Learning Institute in 2012.

In 2003, when he was appointed to his first three-year term on the Murrysville Community Library (MCL) Board of Trustees, Dr. Greenberg began what has become a new career with public libraries. In 2012 he began a fourth three-year term. He served as Board Treasurer 2004-2007 and has been President 2008-2012. Also, in 2004 he became a member of the Board of Directors of the WCFLS, as MCL's representative. He served initially as Secretary and Treasurer, then Board President 2006-2007, then again Treasurer 2008-2011; he is President currently. He served two three-year terms until 2012 on the statewide Board of the Pennsylvania Citizens for Better Libraries (PCBL), and was Treasurer 2007 – 2012. He has been a Director of the MCL Foundation Board since 2008. These various public library activities led to his receiving Citizen of the Year Award in 2009 from the PCBL, and 2011 Volunteer of the Year recognition from the Municipality of Murrysville.

- I love libraries; I recently became a NYS certified biology teacher for grades 7-12; and I have research experience with soil seed banks and vegetation response to wildfire.
- Actually, I did not volunteer. Our executive director found out about it and applied. But I am very excited about this opportunity.
As for background, I was a staff development director for Frisco ISD. The work I did there is very similar to what we want to accomplish here....facilitate learning for adults.
I was trained well in how to hold seminars, keep folks on task, make sure we keep moving and how to develop thought-provoking questions. Most importantly, I learned that ‘to facilitate’ means allow others to think and learn.
- I like the science aspect of reading and helping others.
- I enjoy helping people find the ‘Aha!’ moment in understanding issues that are important in their lives. I was involved with a very high-profile science project, Biosphere 2, for many years and enjoyed explaining the project to audiences worldwide. I currently give composting workshops, mostly to adults, using concepts from systems ecology to help them understand both their small composting systems and the systems of the earth.
- Some motivations:
 1. I am the project PI.
 2. I have a keen interest in communicating science to the public.
 3. I believe in the mission of the project — to increase the capabilities of libraries and librarians as science gateways.
 Some background: long track record in communicating science to the public; college professor for 24 years.
- I volunteered because I’ll do anything for the library! My background includes an M.A. in anthropology, experience working as an archaeologist and museum curator, experience in public speaking, and expertise in heritage/traditional foods as a chapter leader for the Weston A. Price Foundation which is dedicated to educating the public about nutrition and traditional foods.
- Motivation: As a college professor in a chemistry department, science education is obviously what I have chosen as a career. In addition to my expertise and interest in teaching chemistry on the college level I am a very strong believer in liberal education. I recognize that the majority of people are not as innately interested in science as I am but I do believe most people recognize the utility of science knowledge and share the fascination of scientific discovery (when it is relayed at a level where it can be understood).
Background: I grew up in a family that equally values science and the arts and has an extremely high regard for people of all cultures, genders, and backgrounds. This was reinforced by my primary, secondary, college and graduate education.
Previous Experiences: I have taught in a college chemistry curriculum for over 20 years and take particular pride in seeking to make chemistry accessible and interesting to anyone who sits in my classes. In addition to teaching chemistry courses I have been involved with the university honors program for 20 years and taught a general science honors course, ‘Scientific Inquiry’, on 4 different occasions. I have also volunteered in elementary schools to present science demonstrations, delivered several public ‘lecture-demonstrations,’ which are typically 90 minute presentations of entertaining science demonstrations with appropriate, not-too-technical explanations to accompany them.
- I couldn’t say NO to Library Director, Mr. John Stevens.
Motivation: to be involved in an open, non-political, community discussion of current topics involving the citizens of this community.
Background and Previous Experiences: retired college and university biology instructor and assistant professor. (Including dual credit for high school students). M.S., teaching assistant at TAMU, sixteen years teaching at Lamar University and seventeen years at Navarro College.
- The library staff asked and I thought the intent of the program was good. I have a master’s degree in biology and have taught over 20 years.

- I am a trainer with over 25 years' experience in the technical field. In addition- I work for General Electric in the Energy Services, and I am very involved in trying to reduce emissions. I have worked in the Athabasca Oil Fields, CO2 Sequestration, and Fossil Fuel (Gas Turbines) using Natural Gas, Liquid Fuel, Synthetic Gas, and Gasified Coal.
- There is a pressing need for science education and discussion in the United States.
My background is in science:
A.A.S Plant Science/Horticulture
B.S. Ecology and Environmental Education
M.A. Ethnobotany
I have worked grown, studied and observed plants for over 25 years and also teach in the above fields for SUNY Empire State College.
I also frequently teach and lecture for workshops and other educational organizations.
- I was recruited by Debra as I am a former science teacher with the Pacific Science Center in Seattle. My degree is in Microbiology and I did virus research at the University of Washington. I am a Park Ranger with the North Cascades National Park and a former Park Ranger with the City of Bellevue, Washington. During my service with both agencies, I have taught students and adults natural history, resource protection and environmental awareness.
- I would like to help get more people interested in STEM topics.
Background: BSEE, Masters in Ecology & Evolution, 10 years as a Multivariate Statistician working in Life Sciences, and 30 years working with computers in various venues. Extensive experience in the electric utility industry.

[Click here to return to the annotated survey.](#)

APPENDIX D
Pushing the Limits
Librarians: Professional Development Survey

1. Please rate your level of agreement or disagreement with each of the following statements about the “Pushing the Limits” professional development workshop.

	Mean (1-5)	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
The workshop leaders were knowledgeable.	4.70	–	–	–	30%	70%
The material covered in the workshop will be useful when I implement Limits programming.	4.60	–	–	–	40%	60%
The material covered in the workshop was clear and understandable.	4.55	–	–	–	50%	50%
Time in the workshop was well spent.	4.45	–	–	10%	35%	55%
The material covered in the workshop is relevant to my library, community, and patrons.	4.30	–	–	10%	50%	40%
The workshop was well organized.	4.20	–	5%	20%	25%	50%
The workshop leaders understood my professional development needs.	4.10	–	–	30%	30%	40%

N = 20

How well did the “Pushing the Limits” professional development workshop prepare you to:

	Mean (1-5)	It did not prepare me at all (1)	It prepared me only a little (2)	It somewhat prepared (3)	It generally prepared me (4)	It prepared me very well (5)
...facilitate Limits events in your library?	4.40	–	–	5%	50%	45%
...coordinate and plan for the series of Limits programming?	4.30	–	–	15%	40%	45%
...engage audience members during Limits events?	4.20	–	–	25%	30%	45%
...encourage audience discussion and interaction during Limits events?	4.20	–	–	25%	30%	45%
...publicize and market Limits programming in your community?	4.15	–	–	20%	45%	35%
...work effectively with your science partner in co-facilitating Limits events?	4.15	–	–	25%	30%	45%
...troubleshoot Limits events when things aren’t going as planned?	4.15	–	10%	10%	35%	45%
...work effectively with your science partner in planning Limits events?	4.05	–	5%	15%	50%	30%
...support audience learning during Limits events?	3.95	–	5%	30%	30%	35%

N = 20

2. Is there anything else you’d like to share with us?

Marketing

- I liked the sample letters and media alert. I find having an example to copy helps me get the most out of my time.
- I was unclear about the marketing exercises. Some of them made it seem like we should come up with our own materials and slogans, but the sample bookmarks, posters, and press releases included in the notebook seem sufficient to me.
- The workshop was well presented – I just wish there was more time for the marketing component!
- I would like to see more of the marketing materials such as the posters and bookmarks and what is going to be provided and in what format.
- I would have liked an example marketing plan prepared for a library that was doing Pushing the Limits. I find baseline objectives to be difficult to come up with, and would have appreciated seeing how another library was setting their goals.
- I would have liked more discussion about how to promote science without mentioning science.

Grant Information/Administration

- I would have appreciated more information about the budget. I am still not sure if it is required or suggested and if materials (such as books) are to be provided or need to be purchased.
- I would have preferred to have more information before the grant process. I find it really hard to write a grant when I know nothing about expectations or budget.
- Too many questions went unanswered. When I applied, I mentioned that we would need food to attract community members to the programs; at the workshop, I asked if the money could be used to purchase food, but no one had an answer. Also, I still don't know when the check is to arrive. I can't do much planning until the money is here. I have to go through my college's requisition process to spend any money, and that process is not very swift. I don't think any of the other libraries face the same challenges that I face.
- The workshop gave me a better understanding of how the planners intended the pieces of the sessions to fit together. As far as actually making it go, I think there was some useful information, but perhaps it would be helpful to have someone with experience in programming at very small and underfunded institution in on the planning of that. I already know how to run a class and a meeting; I would have liked some more insight into the admin side.
- It would have been very helpful to have certain information farther in advance. For instance, we were given only one month in which to buy 2 books and read them both. That happened to be one of my busiest months, and I barely finished the reading before the workshop (and gave up all of my pleasure reading time in that period to do so). Also, communication in general about the workshop was sometimes confused. The dinner start time changed between the two e-mails we were sent (from 5:30 pm, to an optional reception at 5:30 pm and dinner started at 6). At the workshop, it appeared that some participants hadn't gotten that second e-mail.

Books

- If any more titles are to be suggested I would like to see a small group made up of the rural patrons that are to be reached, suggesting them.
- I would appreciate having a little more choice in the titles for my patrons.
- A couple of the chosen book titles are going to be a bit problematic for me, and for my community, but that is a personal hesitation. I really look forward to this event cycle.
- I think it would have been beneficial to spend more time; it felt rushed. Since we were already there, why not spend more time? Schedule seemed driven by filming, not by information sharing. Two big questions and one observation: how to handle changes in choice of books and how to engage people not already interested in these areas...choice of books is at a level where reader must be fairly sophisticated. Once we spark an interest, what next to keep the interest alive or support career changes and desire for further education, workforce redevelopment, and retraining? All in all, the quality of the workshop was excellent and the level of caring and involvement was very evident. I felt privileged to participate and we are excited to offer these programs and other related programs to our patrons. Many thanks!

Filming the PD

- It was a great program. The recording threw me at first, but after getting used to it, I didn't notice it at all. Thanks to everyone.

- If there is more videotaping to be done, I would limit the amount of extreme close ups. I find it difficult to focus when there is a camera 1 foot from my face.

PD Venue

- The Kennedy School was a gorgeous venue; I really enjoyed all of the historical details, and the terrific renovation.
- I enjoyed the “school” location, but would not recommend it for future events with any disabled folks.
- Loved the venue; it was a great experience and the surroundings were a bonus.

Facilitation

- I would have liked to see a discussion where some of the people were “planted” to make off-color statements.

General Kudos

- I thoroughly enjoyed meeting with the other 19 librarians and having the opportunity to get to know a bit about them! It is always nice to have a face to go with the name.
- I enjoyed the workshop and getting to visit with the other librarians who attended. I think we are all excited about this new type of program, but anything new and challenging is also a little frightening. I look forward to introducing this program to our community and seeing it come to fruition.
- I also liked the opportunity to get to watch some of the films. It is now something that I am able to talk about because I have seen the quality and understand the concept of what was being covered in both films. I am already talking this program up (wom) with my patrons and in the community and have 3 people that will be definite participants in the Pushing the Limits program!
- I want to thank those who made travel arrangements and lodging/meal plans. Airline ticketing, transport to the site and the site itself were very accommodating. The meals [were] very good. The organization and use of our time in the workshop was optimized. The materials supporting the presentations were appropriate and well done. I look forward to more orientation to the planning and presentation of the “Pushing the Limits” series in our community. By the way, a call to Radio Taxi rather than taking Broadway Taxi at the cab stand would have saved about 1/2 the fare.
- Thanks for the very well-planned workshop!
- I thoroughly enjoyed this conference and found it enormously helpful in planning to implement Limits in a way that maintains the spirit of the grant and be deeply satisfying to our patrons. The guest speakers were fun, clearly good at their professions (education and marketing, for instance), and personable.
- Thank you for this wonderful opportunity. I think that it is fantastic that my library is a part of this pilot program and I think that it will be a huge success not just for me but for all who participate. I am so very much looking forward to doing the programs after the first of the year!!
- Thanks so much!

APPENDIX E
Pushing the Limits
Librarians: Post-Programming Survey

1. Overall, how effective would you say the “Pushing the Limits” programming was at:

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)	Not sure
...holding the audience’s interest?	4.44	–	–	3	4	11	–
...making the audience want to learn more about science?	4.13	1	1	–	7	7	2
...increasing the audience’s interest in attending other public science programming?	4.13	–	2	3	2	9	2
...teaching the audience something about science?	3.94	1	1	2	8	6	–

N=18

2. Overall, how effective would you say the “Pushing the Limits” programming was at:

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)	Not sure
...advancing the goals of your library?	3.94	–	1	4	8	5	–
...serving your community?	3.89	–	2	3	8	5	–
...increasing your library’s “presence” in the community?	3.56	1	1	7	5	4	–
...reaching new populations in your community?	3.50	–	1	10	4	3	–
...expanding your library’s partners to new community groups, organizations, agencies?	3.11	2	3	6	5	2	–

N=18

3. Looking back over all four of the programming units, how effective was each of the following components in engaging the audience?

<i>Connection</i>	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Book: Thunderstruck, Erik Larson	3.89	1	1	2	9	5

Video segment with author Erik Larson	3.82	–	–	6	8	3
Video segment with artist Roxanne Swentzell	4.06	–	–	6	4	7
Discussion questions provided by the Limits team	3.87	–	1	4	6	4
Discussion among audience members	4.47	–	–	2	5	10
Your science partner	4.63	–	–	–	6	10
Event overall	4.06	1	1	1	8	7

N=15-18

<i>Knowledge</i>	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Book: Earth's Children, Jean Auel	2.88	2	3	7	5	–
Video segment with author Jean Auel	3.71	–	1	5	9	2
Video segment with chef Sean Brock	3.82	–	1	5	7	4
Discussion questions provided by the Limits team	3.73	1	–	4	7	3
Discussion among audience members	4.24	–	–	2	9	6
Your science partner	4.59	–	–	–	7	10
Event overall	4.06	–	1	2	9	5

N=15-17

<i>Nature</i>	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Book: When the Killing's Done, T.C. Boyle	3.67	–	2	6	6	4
Video segment with author T.C. Boyle	3.78	–	1	7	5	5
Video segment with triple-amputee athlete Cameron Clapp	3.89	–	2	5	4	7
Discussion questions provided by the Limits team	3.63	1	–	7	4	4
Discussion among audience members	4.33	–	–	1	10	7
Your science partner	4.61	–	–	–	7	11
Event overall	4.00	–	1	4	7	6

N=16-18

<i>Survival</i>	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Book: Arctic Drift, Clive Cussler	3.94	1	1	2	8	6
Video segment with author Clive Cussler	4.22	–	1	3	5	9
Video segment with combine demolition derby competitors Julie and Cory Shrum	3.56	1	1	8	3	5

Discussion questions provided by the Limits team	3.81	1	–	4	7	4
Discussion among audience members	4.56	–	–	–	8	10
Your science partner	4.72	–	–	–	5	13
Event overall	4.28	–	–	3	7	8

N=16-18

4. Now that you’ve completed the “Pushing the Limits” program, please tell us a little bit about how well it met your expectations and whether you felt adequately prepared, knowledgeable, and competent to fulfill your role as the facilitator of the program.

Common positive responses:

- Felt prepared, comfortable and competent as facilitator
- Excellent training and materials
- Program was well-received by patrons
- Excellent results overall; exceeded expectations
- Science partner was very helpful
- Enjoyed running the program and would want to run similar ones in the future

Common negative responses:

- The books were ineffective
- The “science” got lost in the program
- Program promotion or planning was too time-consuming
- Felt unprepared about what the program entailed throughout the process

[*Click here to see a complete list of responses.*](#)

5. How well did the materials and training provided by the “Pushing the Limits” team prepare you to plan, publicize, and co-facilitate the Limits programming in your library?

Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Quite a bit (4)	A great deal (5)
4.56	–	–	–	8	10

N=18

6. If you have comments about the materials and training, please share them here:

- Everything was fine.
- Training was a must and really prepared me for the program. The materials were very good and answered all of my questions.
- Even though I have led book discussions, many of the nuts-and-bolts suggestions on facilitation and troubleshooting were good to learn or be reminded of. Participating in a simulated session was also valuable.
- Everything was well thought out and presented. Support was great; the training in Portland was really wonderful; a highlight of the experience. A love of science and learning shines through.

- I think getting a chance to meet with the other pilot librarians helped me. I had faces to put with emails and other communications. The training was excellent and prepared me for the programs that I held. Must admit it was easier than I thought it would be, because I felt so prepared and confident.
- The training and materials were much appreciated. I referred to the Handbook on many occasions. I however, overlooked or never found the prepared discussion questions for the books referred to in previous questions in this survey.
- The materials were helpful. Having questions to begin with is great. The training was good as it gave us different ways to look at things.
- Being provided with the questions to ask was a great help. I looked up a short bio on each author online, so I was able to add a bit of information that was interesting. My groups were more interested in discussing the books in general, than in the science presented in the books.
- The videos of ordinary folks applying technology in various ways was a very strong part of this series. These short films really spurred discussions effectively. Also, the idea of having a scientist as the moderator worked quite well due to the training webinar along with provided questions.
- The training was much better than the materials.
- Maybe make the discussion questions easier handouts.
- Materials were good but could have been better. I provided a packet of questions and information to participants in advance of the programs to help them focus their thoughts the night of the program. The black and white format of the materials was not the quality I expected; the art was childish. Training materials needed to be given to workshop attendees in digital format. I found the listserv to be a “kludgey” way of communicating and sharing ideas and information. This was biggest shortcoming, not having a means of talking amongst ourselves at the outset. I realize it may have helped us develop our programs more originally but I like the synergy and refinement opportunities to be gained with a group. There is so much to be gained by sharing what we have learned! It would be of great benefit to have the workshop attendees come back together as a group to put it all together. I find describing the experience in a survey to be inadequate. It was a terrific set of programs and we plan to continue this type of discussion on other topics.
- The only suggestion I might make would be to have a small summary added for each book.
- The promotional images and the ideas shared on the listserv were immensely helpful. Even so, the promotion took many hours of staff time.
- For me, in this community, I needed to penetrate established groups and let their leaders promote participation from within. As a 26 year resident, I am still a “move in” to the community and that gives little leverage on decision making. Attendees were mostly “move in” folks also. In this case, had I “given” the project to locals the attendance could have certainly been more. The materials were outstanding and those attending thoroughly enjoyed the discussions and have asked if there will be more.

7. Overall, how successful would you say you were at accomplishing each of the following in your library?

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Working effectively with your science partner in co-facilitating Limits events	4.72	–	1	–	2	15
Facilitating discussion at Limits events in your library	4.56	–	–	1	6	11
Working effectively with your science partner in planning Limits events	4.56	–	2	–	2	14
Using discussion questions to engage the audience at Limits events	4.53	–	–	1	6	10
Coordinating and planning for the series of Limits programming	4.33	–	1	–	9	8
Engaging audience members during Limits events	4.44	–	–	–	10	8
Encouraging audience discussion and interaction during Limits events	4.44	–	–	–	10	8
Supporting audience learning during Limits events	4.39	–	–	2	7	9
Troubleshooting Limits events when things weren't going as planned	4.24	1	–	2	5	9
Publicizing and marketing Limits programming in your community	3.94	–	2	3	7	6

N=17-18

8. To what extent do you feel that your experience presenting Limits programming at your library has prepared you to:

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Quite a bit (4)	A great deal (5)
...facilitate other adult science programming in your library?	4.33	–	2	1	4	11
...facilitate adult programming integrating books and videos in your library?	4.28	–	1	3	4	10
...develop new adult science programming in your library?	4.06	–	2	2	7	7
...serve as a resource for science information in your community?	3.89	2	1	2	5	8

N=18

9. Do you think your library should continue to offer adult science programming events like “Pushing the Limits”?

Mean (1-5)	Definitely not (1)	Probably not (2)	Neutral (3)	Yes, probably (4)	Yes, definitely (5)
4.35	–	1	3	2	11

N=17

10. Based on your experience with the “Pushing the Limits” program, how likely is it that you will continue facilitating adult science programming in your library?

Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
4.17	–	2	2	5	9

N=18

11. Now, after your participation in the “Pushing the Limits” program, how would you describe:

	Mean (1-5)	None (1)	Only a little (2)	Some (3)	Quite a bit (4)	A great deal (5)
...your personal interest in science-related topics?	4.39	–	–	1	9	8
...your personal knowledge of science-related topics?	4.17	–	–	4	7	7
...your interest in helping adult patrons find resources on science-related topics?	4.67	–	–	–	6	12
...your ability to help adult patrons find resources on science-related topics?	4.50	–	–	1	7	10
...your comfort with helping adult patrons find resources on science-related topics?	4.56	–	–	1	6	11
...your interest in facilitating adult programming on science-related topics?	4.56	–	–	1	6	11
...your ability to facilitate adult programming on science-related topics?	4.56	–	–	1	6	11
...your comfort with facilitating adult programming on science-related topics?	4.50	–	–	1	7	10

N=18

12. How could the “Pushing the Limits” program be improved for the audience, for librarians, and/or for science partners?

Common suggestions:

- Involve participants and libraries in selection of future books
- Help libraries in promotion/marketing (especially to encourage a younger, less scientific audience)
- Bring out the “science” (i.e., more science-based books)
- Improve the materials overall (i.e., books, discussion questions, handouts)
- Provide more information to libraries throughout the process (i.e., more detailed grant and more ongoing communication during program planning)
- Videos were very popular so emphasize them more
- Allow [more] opportunities for ongoing exchanges among libraries
- No improvements necessary

[Click here to see a complete list of responses.](#)

13. Is there anything else you’d like to share with us?

[Click here to see a complete list of responses.](#)

Full Text of Open-Ended Responses

14. Now that you've completed the "Pushing the Limits" program, please tell us a little bit about how well it met your expectations and whether you felt adequately prepared, knowledgeable, and competent to fulfill your role as the facilitator of the program.

- Truthfully, the books chosen were not of much interest to our local communities. In general, we had a more positive response to the supplementary field trips and workshops that we provided than to the discussion sessions. It was sometimes difficult to see where science fit into the book and video topics. Science and technology seemed to be used synonymously in the program, which I think is misleading. The concept of the program did inspire me to venture further out into our communities and stretch my imagination in providing supplementary programming, though, which was a bonus. I didn't feel uncomfortable in my role as facilitator of the programs. I couldn't have done it, though, without a science partner who went further than the extra mile. The planning and promotion were very time consuming and might be difficult for other small libraries without strong volunteer help.
- It was a very well received program in our community, drawing some people to 3-4 of the programs. I felt extremely prepared for the program and competent to lead it.
- It went better than I expected, I was very pleased on how well each program went. I was prepared and ready for each program, but the discussions went in unseen directions...which was very good for all concerned. Participants were not afraid to speak out or voice their opinions and we never ran into problems of any sort. Everything went smoothly.
- "Pushing the Limits" was great. The series and the supporting materials were well planned. That careful preliminary work provided us with the means to create excellent local results.
- The training was wonderful and very complete. The only worry I had was whether or not I'd be able to get enough folks to attend. The trainings for the facilitators were perfect. Our facilitators felt more comfortable after the trainings and led our groups perfectly
- I was expecting a program that was much more explicitly science-based, with explicit scientific discussions around controversial issues. Pushing the Limits was much different than that expectation. I fault myself in this somewhat for not making sure that I was very clear on exactly what we were applying for. Had I had a clearer understanding of exactly what the programs involved I might not have applied, as I would have expected this kind of programming to be less successful in our particular community than the programs I was envisioning when applying for the grant. Few of the books met my expectations for a "good" discussion book. Although they generally served their purpose for this specific programming, they all violated one or more of the guidelines I use when choosing a discussion book: (a) less than 350 pages unless a very compelling book (and absolutely never more than 500 unless there is a very specific reason why only that book is suitable) because the longer the book gets, the fewer people come to a discussion program; I ameliorated this somewhat by strongly emphasizing in the publicity for the last programs that it was not necessary to read the book prior to attending; (b) not a continuation of a series; (c) well-written (having read Arctic Drift, I would not recommend Clive Cussler even to someone with a low level of literacy). If you expand this program I advise that you involve a librarian who has recently worked or is currently working on the "front lines" of programming in the selection of additional books. My sense is that whoever suggested these books, if a librarian, has not planned a book discussion for the public in quite some time (or conceivably works for a *very* different community than the one in which my library is situated). I have previous experience with planning and publicizing programs and leading book discussions and am moderately knowledgeable about scientific topics, so I felt adequately prepared, knowledgeable, and competent to facilitate. The only obstacles in my ability to do so were that sometimes information and materials were not available in a timely manner. For example, we had to push

our series start a month later than I preferred because it wasn't clear that the videos would be ready in time.

- You folks did a good job, but as the pilot programs, we really were a bit in the dark. One of the most effective tools was the listserv and the ideas from the other participants. I hope you are distilling them for the next batch of participants.
- The program exceeded my expectations! Our community participation was great and the feedback from them was wonderful. I know they all appreciated the program and were glad that they participated. I felt that my facilitator and I were prepared for the events and we enjoyed presenting the programs. All the materials provided were helpful for each session.
- The experience was awesome. My only regret is I can't do it again for next year. I would love to have even more participation; but the people who came were well prepared and had read the book(s). Most people brought relevant materials to share with others: newspaper clips, magazine or television citations, additional books or websites, etc.
- I felt that the book selections adequately related to the theme and subjects. I became comfortable with presentation of the series to prospective participants and then to the individual meetings. It was easy to turn the discussion over to the science partner and the audience. It helped me construct surveys on their view of the discussions and their reactions. Each meeting concluded with reaching questions and satisfaction at having been there and participating.
- I loved facilitating these programs! These programs weren't just typical library book discussions, analyzing the book and answering questions. These programs were topical discussions that invited adult attendees for an evening of broad-ranging adult conversation. The focus was on the topic, not the book. That is the key! The book was only one element of the discussion. Videos, articles, other books, personal experiences of attendees, and knowledge scholar input fed the discussion. The attendees and the knowledge scholar were intelligent, interesting, and interested in the topics. As the facilitator, all I had to do was to seed the discussion with a question now and then and make sure everyone had a chance to provide input.
- I thought that the training and materials helped immensely. The training showed us how to present the materials to our audience in a way that would underscore the science in the materials without feeling threatening for those that shy away from science. The questions were prepared so well, that I didn't need any of my background materials that I brought in case.
- From feedback given by participants at each program, I believe they enjoyed it more than I would have expected. I just wish we had more people participate. I've been told that we were fortunate to get as many people to attend as we did, and I'm sure that we would have had fewer participants if we'd used our library building. I have a science background, so I felt capable of being the facilitator; it was nice to have a science "expert" on hand, though.
- Now that the program series is complete, I feel very good about how everything turned out. Our science partner was great and he prepared the discussions. I merely had to set up the room and organize and prepare the food and drink. I shared the Pushing the Limits handbook and videos with him and he was very well prepared.
- I accepted the grant before really understanding how it would work. I will never do that again. I did not find the books on the list to be compelling and, despite lots of advertising and getting excellent facilitators, neither did the public.
- This program surpassed my expectations. Since I was not the original person to write the grant, I went into this not really knowing what to expect. The program was very popular with our community and has spurred an interest in further book discussions.
- I was very comfortable with my role as facilitator. I have led book discussions previously. The questions provided were helpful. I loved the addition of the video segments as it provided an added component to the discussions. Our science partner was fantastic. She brought a lot to the discussion.
- I believe the training materials provided by the PTL team in Portland were extremely helpful with my preparation for facilitating these events. I do have extensive experience facilitating arts and

culture reading groups, however PTL was the first time for my working with a science theme and facilitator.

[Click here to return to the annotated survey.](#)

15. How could the “Pushing the Limits” program be improved for the audience, for librarians, and/or for science partners?

- Involving rural librarians in the book/video topic selections would be helpful. Also, I think in an attempt not to overwork the science emphasis, the science became so deeply hidden it was sometimes hard to find. Our patrons were excited about the actual science embedded in our workshops and field trips. So, I think it likely that being more explicit about the science could be beneficial. Our community has never been much for book clubs, but the videos were really successful here. Have you considered designing some programs just around the videos?
- Marketing was still the hardest part, some of what I did worked out wonderfully, some not as much.
- The only thing I can think of is to offer more than one book selection for each topic for the participants that did not want to read the specified book or books. Otherwise I believe the way the programs were structured and presented that they did very well. I only heard positive feedback, except for a book selection that some were not happy with. The video segments lent themselves to great discussions and back and forth conversations and question and answer periods during and after each segment. My Science partner and I were on the same page and our programs ran very smoothly. We had no problems at all! We both were surprised how well the programs were received and how well every program went. No surprises, no drama, just people coming together to have conversations and discussions on a common theme.
- I think that the series was well-planned as is. No improvements are necessary.
- Most of the libraries in our area are afraid of the program. They worry that it will be too hard for someone with a non-science background. I’ve assured them that if we can be this successful-they can too. Some of the books — Auel and Boyle — were not popular choices with our group. There were requests to change the books in the next sessions.
- Please provide information in a timely manner, at least two months in advance of any planning the libraries need to do. I felt as though my ability to do my job effectively was hindered by waiting for information and materials, especially late in 2012 as I was hoping to get started on planning programs. I would suggest selecting shorter books that aren’t part of long-running series if you expand the selection. See my answer to a previous question for more comments on the books. Please also be more explicit in your description of the program to librarians. My idea of what a “science cafe model” meant was very different than what the programs actually were. In your request for applications, you should say exactly what each program involves and what the books and topics are. That will enable librarians to make better decisions about whether this programming is right for their community and will therefore help to ensure that the grant money goes to where it will do the most good.
- Maybe on ongoing exchange of ideas on the listserv. We are continuing, thanks to the generosity of our facilitator and it would be nice to keep sharing “best of ideas” for new folks.
- For a new type of program for adults, I think everything was planned well.
- The author interviews were great and pertinent; my group enjoyed the second segments, but sometimes it was a challenge for relevancy. People did not always enjoy the chosen books, but there was never a lack of rich discussions. The books as a starting point works very well; but the conversations that resulted were amazing.

- I think that if likely candidates (readers, science oriented professionals, opinion makers) were chosen and invited for participation in the discussions personally and given a book, they and some they cater to might participate.
- Distribute training materials digitally. Improve the quality of the marketing materials. Provide a better means for communicating amongst participating libraries. I'm not sure the attendees at my library were the ones you hoped to target with this series of programs. We did have two teens attend the first two programs, we also had a 92 year old woman who attended, and many of our attendees were retired or nearing retirement, most were over 60, many had worked in a science-related field, all of them appreciated the opportunity to have intelligent, adult discussion on a topic that was not limited to the content of a book. We had only 2 people of the 20-24 people in each program who were between 20 and 55 years old.
- It was a great program but would probably get more participants with shorter books. Often our patrons aren't just science averse, but avoid reading also. Put the questions for the programs out separately from the science partners PowerPoint so they are easier to find.
- I thought the program was great just the way it was. I think librarians should feel free to change the order of the books being presented, though. I also would not pick a book as long as Jean Auel's.
- Our science partner was not a big fan of "The Land of Painted Caves" for Knowledge. He suggested a dozen or more other titles, the top three being: Hyperspace, Our Final Frontier, by J. Gribbin; A More Perfect Heaven: How Copernicus Revolutionized the Cosmos, by D. Sobel; and Undaunted Courage, by S.E. Ambrose.
- Choose better books with more science content. There were so many better options, both fiction and non-fiction that could have taught people more about science. My science readers were not interested because there wasn't enough science and my fiction readers weren't interested because the writing wasn't that good. The Jean Auel book was a particularly poor choice, as the length turned off even the fans of her earlier books.
- The Land of the Painted Caves book was not well-received. Perhaps a different book for the Knowledge section would be better.
- In our community attendance was low due to lack of interest in the books. Perhaps other science topics would have been better for us. We had patrons tell us they just couldn't get interested in several of the books. However, discussion was good with the people who attended.
- Allow participating librarians and science facilitators to suggest additional book titles for future programs.

[Click here to return to the annotated survey.](#)

16. Is there anything else you'd like to share with us?

- Thank you very much for allowing us the opportunity to participate as a pilot library. The materials, especially the videos, were well done and interesting. Although the discussion/viewing sessions as designed were not particularly successful here, people who attended developed new friendships as a result of their participation. And, as I mentioned before, the program helped me expand my ideas about adult programming. I'm excited about these new possibilities.
- Not sure if anyone who read or tried to read Jean Auel's book enjoyed it.
- I am pleased that I was chosen to be a part of this pilot program and am sad that it is over. I hope that it is something that will be expanded upon and that we are asked to continue holding these programs for years to come. I know my participants would be back and so would my science partner. Thank you for all the support and guidance as we worked our way through this wonderful series of programs! I already plan to run the first 2 programs again for some that came late into the program. They requested that they could read and see what they missed. Also looking forward to a

copy of the training DVD and participants want to watch also as we were one of the libraries that were filmed during a program.

- Thank you very, very much for providing us with this programming opportunity. We appreciate your considerable preparation efforts greatly!
- I just want to thank everyone involved for the opportunity to participate in this project. It has broadened our thought process in planning for events for our community. This is an awesome program!!
- I think the programming is solid, just not totally right for our community. It engaged people when they came, but even with much more publicity than we usually do for programs we had generally numbers. One interesting phenomenon was that we saw numbers build; there were a few new people each time, but previous attendees mostly returned for subsequent discussions. I think that for me as a librarian doing programs, the best thing that came out of this grant was a broader way of thinking about the kinds of programs I want to offer; though the actual discussions didn't get many people, I offered other programs at the same time on related topics which drew good attendance. These programs were on topics that I wouldn't normally consider, so I'm going to try to pay more attention to variety in my programming in future.
- This has been a phenomenal experience. We did not attract as large an audience as I hoped, but we had great conversation — such that we will be doing more as a result of this program, both with science and otherwise.
- Thank you for the opportunity to participate in this project!
- Enthusiasm has been so high — my group has asked that I find a way to continue science themed programs/book discussions starting again this fall. So I am now looking at ways to do this. It was too valuable an experience to let it be passive; I want to build on what we have successfully started. Thanks so very much!
- Thank you (NSF) for selecting the Fairfield Library as a participant in this pilot program. It has opened opportunities for service to this community not being practiced. The Mayor was impressed with our selection and insisted on being mentioned as the donor of the meeting location in every ad. The City is one of our main financial resources. As a non-profit corporation, our lack of funds rarely allows a program of this quality and value to be presented from the library. Best wishes for your future programs.
- I love the way the programs focused on a topic with many means of providing input: videos, books, magazine articles, newspaper articles, the internet, personal experiences, and knowledge experts. I have an idea about how you might tweak the programs to subtly entice a younger age group of attendees. Younger ones have busy lives with families and many outside commitments. They take information bites in smaller pieces. We have found increasing traffic in this age group by expanding our collection of graphic novels and locating them near our main circulation desk. We have stats to back it up. Graphic novels are full of science-related topic! And they're not just comics. They come in fiction in all genres and non-fiction in all disciplines. I know, this sounds weird coming from a 60+ year old librarian but I would love to talk to the science partners in this grant about the idea. My knowledge scholar is in agreement. I feel so fortunate to have participated in this series of programs. They can be life changing, relationship building, exciting events. I had to spend a day afterwards just unwinding from the experience! Many Thanks!!!
- Wonderful program that really engaged our patrons. Some comments from our patrons: Would come to do more of this, please don't end it! Loved the program! The science experiments and the videos made the evening much more interesting than just talking about the story structure. Please do it again! Very good program overall that provided a variety of viewpoints. It was an interesting educational program that made me think.
- Thank you very much for the opportunity to participate in Pushing the Limits. We had a great time organizing the program and enjoyed the excitement it brought to our community. After the fourth and final program, participants were left wanting more and we hope to continue offering such programming.

- As you can tell, I did not have a great deal of success with the books themselves. I was better pleased with the related programming I created — a talk on disasters for Survival, The movie — Cave of Forgotten Dreams for knowledge etc. What the grant provided that was useful was money for time and materials to create this supplementary programming.

[Click here to return to the annotated survey.](#)

APPENDIX F
Pushing the Limits
Science Partners: Post-Programming Survey

1. Overall, how effective would you say the “Pushing the Limits” programming was at:

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)	Not sure
...holding the audience’s interest?	3.95	–	–	4	13	3	–
...teaching the audience something about science?	3.37	–	2	10	5	2	1
...making the audience want to learn more about science?	3.50	–	2	7	10	1	–
...increasing the audience’s interest in attending other public science programming?	3.53	–	2	8	6	3	1

N=20

2. For which of the following Pushing the Limits events did you serve as the science partner at your partner library? (Please check all that apply.)

	N
CONNECTION: “Thunderstruck,” Erik Larson, story about artist Roxanne Swentzell	12
KNOWLEDGE: “Earth’s Children,” Jean Auel, story about chef Sean Brock	16
NATURE: “When the Killing’s Done,” T.C. Boyle, story about amputee athlete Cameron Clapp	16
SURVIVAL: “Arctic Drift,” Clive Cussler, story about combine demolition derby competitors the Shrums	15

N=19

Note: Responses exceed 19 as respondents were able to select multiple responses. Of the 20 participating libraries, 17 had one science partner across all 4 events.

3. Looking back over all four of the programming units, how effective was each of the following components in engaging the audience?

<i>Connection</i>	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Book: Thunderstruck, Erik Larson	3.42	–	1	5	6	–
Video segment with author Erik Larson	3.50	–	1	4	7	–
Video segment with artist Roxanne Swentzell	3.42	–	3	4	2	3

Discussion questions provided by the Limits team	3.33	1	–	6	4	1
Discussion among audience members	4.00	–	–	3	6	3
Event overall	3.67	–	–	4	8	–
N=12						

<i>Knowledge</i>	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Book: Earth's Children, Jean Auel	2.69	2	6	4	3	1
Video segment with author Jean Auel	3.25	–	2	8	6	–
Video segment with chef Sean Brock	3.94	–	2	1	9	4
Discussion questions provided by the Limits team	3.31	1	–	8	7	–
Discussion among audience members	3.81	–	1	3	10	2
Event overall	3.69	1	1	2	10	2
N=16						

<i>Nature</i>	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Book: When the Killing's Done, T.C. Boyle	3.75	–	1	4	9	2
Video segment with author T.C. Boyle	3.53	–	1	6	7	1
Video segment with triple-amputee athlete Cameron Clapp	3.60	1	3	3	2	6
Discussion questions provided by the Limits team	3.53	1	–	4	10	–
Discussion among audience members	4.00	–	–	3	10	3
Event overall	4.00	–	–	3	10	3
N=15-16						

<i>Survival</i>	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Book: Arctic Drift, Clive Cussler	3.33	–	5	1	8	1
Video segment with author Clive Cussler	3.43	–	3	3	7	1
Video segment with combine demolition derby competitors Julie and Cory Shrum	2.80	2	5	2	6	–
Discussion questions provided by the Limits team	3.33	1	2	3	9	–
Discussion among audience members	3.93	–	–	3	10	2
Event overall	3.67	–	2	1	12	–
N=14-15						

4. Now that you've completed the "Pushing the Limits" program, please tell us a little bit about how well it met your expectations and whether you felt adequately prepared, knowledgeable, and competent to fulfill your role as a science partner in the program.

Common positive responses:

- Felt prepared and knowledgeable
- Enjoyed facilitating the program
- Participants learned a lot from the discussions
- Discussions were lively and thoughtful (though often focused on issues surrounding the book than the book itself)

Common negative responses:

- Book selections were not great and most participants did not read the books
- The "science" got lost in the program (because the books did not relay much science and because some participants were less interested in the science)
- Wanted to attract more youth and/or a larger number of participants

[Click here to see a complete list of responses.](#)

5. How well did the materials and training provided by the "Pushing the Limits" team prepare you to co-facilitate the Limits programming?

Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Quite a bit (4)	A great deal (5)
3.60	–	3	7	5	5

N=20

6. Overall, how successful would you say you were at accomplishing each of the following in your partner library?

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
Using discussion questions to engage the audience at Limits events	3.60	1	1	4	13	1
Facilitating discussion at Limits events	3.90	–	–	3	16	1
Working effectively with your librarian partner in planning Limits events	4.25	–	–	2	11	7
Working effectively with your librarian partner in co-facilitating Limits events	4.15	–	–	2	13	5
Engaging audience members during Limits events	4.10	–	–	2	14	4
Encouraging audience discussion and interaction during Limits events	4.05	–	–	2	15	3
Supporting audience learning during Limits events	3.75	–	1	5	12	2

N=20

7. Now, after your participation in the “Pushing the Limits” program, how would you describe:

	Mean (1-5)	Not at all (1)	Only a little (2)	Some (3)	Quite a bit (4)	A great deal (5)
...your comfort with working in informal learning environments (i.e., non-school settings)	4.60	–	–	–	8	12
...your interest in helping people in your community understand science-related topics	4.70	–	–	–	6	14
...your ability to help people in your community understand science-related topics	4.35	–	–	2	9	9
...your comfort with helping people in your community understand science-related topics	4.55	–	–	1	7	12
...your interest in facilitating public programming on science-related topics	4.60	–	–	1	6	13
...your ability to facilitate public programming on science-related topics	4.42	–	–	1	9	9
...your comfort with facilitating public programming on science-related topics	4.50	–	–	1	8	11

N=19-20

8. Do you think the library should continue to offer public science programming for adults like the “Pushing the Limits” program?

Mean (1-5)	Definitely not (1)	Probably not (2)	Neutral (3)	Yes, probably (4)	Yes, definitely (5)
4.80	–	–	1	2	17

N=20

9. Based on your experience with the “Pushing the Limits” program, how likely is it that you will continue your involvement with public science programming, whether at the library or elsewhere?

Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
4.55	–	–	2	5	13

N=20

10. How could the “Pushing the Limits” program be improved for the audience, for science partners, and/or for librarians?

Common responses:

- Allow librarians and science partners to choose the books
- Bring out the science (i.e., more science-based books)
- Alter the structure of the program (i.e., longer time limit, more hands-on activity, parent-child event)
- Videos were generally popular and could be emphasized more
- No improvements necessary

[*Click here to see a complete list of responses.*](#)

11. Is there anything else you’d like to share with us?

- I also attended the other sessions as a participant. I thoroughly enjoyed all of them.
- I hope this program is renewed and expanded. I am looking forward to seeing or participating in the next set of programming.
- Yes, years ago in the 1960’s and 70’s my husband, who was a science teacher at that time, received NSF grants that helped him be a better teacher.
- The Cross Plains, TX public library appreciates your interest in us and also your funding of our program.
- I was surprised at the type of people that showed up to these discussions. Whereas I was thinking people with a science background would show up, people with an interest in learning more about that topic, it seemed like the opposite type of person showed up.
- I like the concept that we are all “scientists” in the decision making process in everyday life decisions and how libraries and librarians can foster that concept.
- Our group would like to continue discussions. I have suggested a book to discuss: “The Seven Daughters of Eve” by Dr. Bryan Sykes. Others may suggest more books to discuss.

- Thank you. This was very enjoyable for me to be a part of.
- I would suggest you aim for the 16 to 26 year old crowd using graphic novels as the hook. All of our older participants were interested in using their life experiences to help mentor younger participants in the program.
- This program was of great help to our library and our community.
- Thank you for designing this program. I loved being the science partner, and have you and my library friends to thank for giving me a chance to improve my facilitation skills.
- This is the second such NSF program in which I have participated as facilitator. The first was the six-part film program called Research Revolution: Science and the Shaping of Modern Life. I began doing it in 2003, initially at my community library, then at more than a dozen other libraries over the next ten years, and, most recently, in the Osher Institute for Lifelong Learning at the University of Pittsburgh. I am repeating the Osher program next month. What this suggests is that Research Revolution serves a broad audience. I don't think that I can take Pushing the Limits to a similarly broad audience, not at least in its present form, for these reasons: (1) weaker science and literary content; (2) strongly rural focus.
- Thanks for the opportunity!

Full Text of Open-Ended Responses

12. Now that you've completed the "Pushing the Limits" program, please tell us a little bit about how well it met your expectations and whether you felt adequately prepared, knowledgeable, and competent to fulfill your role as a science partner in the program.

- The program went very well. Only 2 or 3 people had read the book, so that discussion was pretty limited. The topic of food is always engaging, so the discussion about food and science was more engaging. I was well prepared with my background in anthropology and traditional foods. The best preparation came from the science partner webinar. That really helped me to understand the goals of the program, how to lead the discussion, and how to get ready.
- Yes, my profession is a high school science teacher, which prepared me very well to lead discussions and answer questions on the subject matter. Before the first segment I was nervous as to how prepared I was, and how the program was going to go, but it was very well prepared and thoughtful.
- I enjoyed the program. I felt that it was able to create a quality dialog about science while adequately entertaining the participants. I learned a lot from participating and think I was able to give a lot of information.
- I felt well prepared and knowledgeable enough to keep a conversation on the various topics moving.
- I thought the book introduced so many complex social issues that caused me to pause and ponder. As a retired English teacher, I am trained as a critical reader. I came up with many questions on my own that could lead to many more discussions. Only about 5 of the 47 people in attendance had read the book, so I geared discussion to issues they could discuss with only a short summary of the book's plot and characters. I had a good discussion at our swimming pool with a woman who could not attend but who has read the book. I have also discussed some of the issues in the book with my family members and others. There were several Navajo students in attendance and having taught units on Navajo culture and taught Navajos I tried to engage them about their beliefs about nature. Some people who read the book commented on the language but felt it was an integral part of who the characters were. For my own enlightenment, I now understand where PETA people are "coming from." Also because my husband's grandfather is revered as "the father" of Capitol Reef National Monument, which later became Park, we have been personally acquainted with issues of what to preserve and what not to preserve. I love teaching and this was a chance to teach again without the need to correct papers and give grades. Thank you. Thank you.
- I didn't know what to expect! However, with the prepared questions — with my modifications — I felt very comfortable facilitating the sessions. I'm not a high-powered scientist, but am a pretty well-trained facilitator.
- Most participants were over 40 years old (probably over 50). It was very frustrating at times discussing topics with people who felt they knew what they were talking about when they didn't. The audience that was drawn to these events were not the people who were already informed but people who thought their opinions mattered. The amount of science discussed verses the broad sweeping ideas of the book fell on the side of what people felt most comfortable talking about (which was not science). I teach college level chemistry. I have also worked on 3-year grants to teach science to K-8 teachers. Those audiences want to learn science. It was never clear to me, even after reading all the material in your grant how much science was intended for the audience to learn, so I approached it from a science point of view, explaining the science of the book — that's not what people wanted, they wanted to have a general "book-discussion," which was fine, there was little to no science discussed because most already felt they knew the science, which most didn't. Like I said, the type of people drawn to this were very opinionated people. At one point I was accused of belonging to "That Group."

- The process of becoming involved in the historical nature of the subject and relating it to current life situations was extremely challenging and effective. I think that with the expertise of the librarian, we did a very good presentation of the importance of science related to everyday life today.
- At first, I thought the group would have limited science knowledge. I quickly discovered that was not so. Being very flexible, I quickly adjusted to the group and was able to contribute a great deal to the science questions of the group. In the following sessions, I asked deeper questions that were open-ended and encouraging discussion. I found the discussions stimulating as the group was knowledgeable and interesting.
- I felt prepared, but I don't think the books were the best out there to introduce science into a non-scientific community. Thunderstruck was probably the best out of the three books. Cussler was a close second. There were scientific themes through all the books but they didn't always lend themselves to the best scientific discussions.
- My background had me prepared to support all four topics. Our audience was older than I expected and most had in depth knowledge of at least one or more of the areas. This led to lively discussions without much prompting.
- I had very high expectations for this program and felt quite well prepared for it based on the electronic materials and webinar provided by the Limits team. I felt I was reasonably effective in my role as a science partner in the program. The discussions that we had about these books did not involve all that strong a science component. I believe that was due to the fact that the books did not have terribly strong science themes to them...but then I felt this was pretty much the aim — a “soft sell” of the science.
- I felt prepared. I had read one of the books and other books by one of the authors previously, so I had an idea of how the authors wrote.
- It provided an avenue for discussing technologies in Energy Production/Consumption.
- The book that I moderated did not appear on your list.
- I think it's a little difficult to say if I was adequately prepared and competent. Although the program wanted a science partner to lead the discussions, science doesn't have much to do with effectively leading a discussion. I didn't want to lecture at all, and the participants in my local library are generally very knowledgeable and know where to turn for more information, as well as how to evaluate the worth of what they find from various resources. I found that it seemed more my role to create and ask good questions, to tie threads of the discussion together, and to perhaps bring in interesting points that not all had thought of. But I didn't feel like I could share my personal experience to any large degree — that's not facilitating; that's talking. So in a sense, I guess that although it's nice I have a science background, it's probably better that I have read widely in lots of areas and have a recent teaching credential that prepared me for asking questions and waiting patiently for answers. It would be interesting for you to get an evaluation of me from the participants at my library. Probably more interesting than my self-eval.
- I felt completely OK in my role as facilitator of the discussions, and I prepared myself in each instance with supplemental materials that expanded the experience for the attendees. That included giving the participants a supplemental reading list of about 50 books, each placed in one of the four prescribed categories. I have very mixed views about the four assigned books. Thunderstruck and When the Killing's Done are good choices, both with respect to content and literary value. Arctic Drift and the Land of Painted Caves are too tedious and of questionable literary value. Also, Arctic Drift just takes too many liberties with its “science.” Painted Caves is so long and tedious that the creativity in it gets lost. There are much better book choices in print to satisfy the needs of Survival and Knowledge. Much better. My own expectations for the program would have been better met had the book selections been better.
- I felt prepared for this discussion. I liked the Sean Brock aspect of the presentation. I might have picked a different (non-fiction) book such as Mark Plotkin's “Tales of a Shaman's Apprentice” and its accompanying video as Auel's work is fiction and many aspects are purely speculative.

- It was a great experience, just didn't get enough community members. Those that came were great.

[Click here to return to the annotated survey.](#)

13. How could the “Pushing the Limits” program be improved for the audience, for science partners, and/or for librarians?

- I thought the program was interesting and engaging as is. However, changing components — adding hands-on elements or breakout sessions — could increase engagement/learning.
- I think the program was pretty well developed. However, I think that there could be some more specific scientific current events tied in with the books and interviews. If there was a specific science content area could lead to more of a scientific discussion.
- I'd just like to say thanks to all who helped me with this program. Thanks for making it so easy!
- Now that there are so many kinds of “starter” materials on the web, these should be better organized and then correlated with turnouts and audiences (i.e., need to account for the community in the kinds of materials that are useful). Also, if we are outside of the realm of experimental study, I think there is no need to dictate the book that is read and a possible PtL extension would focus more on the human interest story and leave a choice of book to the librarian, but with a set of possible choices related to a topic.
- I think our program in Richfield was very well done. I think the time limit for the program helped people to stay interested but it did preclude a deeper discussion of the complex issues in the book *After the Killing's Done*.
- Better choice of books. These did not suit rural Texans very well, for the most part. Rural librarians would have a good feel for their audiences.
- I do chemistry demonstrations for K-12 grade very often. I'm fairly involved with my community. Our community is very family oriented. This program might work better if parents and children were involved. That way parents could help their children.
- The Pushing the Limits program was very effective in demonstrating how humans have pushed the limits in the areas covered and to what extent science played a role.
- The author interviews were well received by the group. The other segments for the first 3 books were not well received. The Jean Auel video seemed to blend well with the book topic.
- I know this was the first year, but maybe a selection of books that the science partner and librarian could choose from that might interest their membership more. The librarian that I worked with is very knowledgeable about what the patrons' likes and dislikes were. Overall, I think this is a great idea and was well received.
- Several of the books were considered painful reading by the participants and were considered quite a stretch to get to the topic of the evening. The graphics were at a third grade level. The books did not seem to appeal to the under 50 crowd. The discussion of the topic for an evening was quite lively and could have gone on till midnight.
- The video segments were a very good thing. They gave 'us' something to organize the discussion around which was very useful. I would like to see future book selections that have a little stronger science component to them. Some suggestions I could offer are: Amanda Ripley's, “The Unthinkable: Who Survives When Disaster Strikes and Why”; Ariana Franklin's, “Mistress of the Art of Death”; Dava Sobel's, “Galileo's Daughter”; Mary Roach's, “Stiff”; Oliver Sacks', “Uncle Tungsten”; Ross King's “Brunelleschi's Dome”.
- Recommend other books that could be used in future public science programming.
- Provide seminars on various topics.
- I think there could have been a better choice of books. There are many better books out there than the ones chosen.

- I think clarification of what science concepts/knowledge you're trying to expand in rural areas would be helpful. Also, your rationale for the book choices would be very helpful. I feel that asking my participants how they liked the book was a dead-end question that either got few comments or harshly critical, questioning comments. I ended up choosing to focus on the theme of the evening, bringing in the book for examples. We steered away from book criticism that way. Also, a clarification on the rationale for choosing "rural" libraries would be helpful, as well as what rural means to the study. My rural participants ended up feeling like being called rural was condescending. This might be as simple as citing studies that define rural and quantifying science learning in those areas defined as rural.
- I'd like the opportunity to suggest some alternate books, as discussed above, which I think would be far more effective, and still to the point. I'd be happy to have this discussion with you.
- Provide more information to the public to try and get more there. Everyone is so busy, so it is tough!

[Click here to return to the annotated survey.](#)

APPENDIX G
Pushing the Limits
Patrons: Post-Event Survey

	N
Georgetown County Library, South Carolina, <i>Connections</i>	10
Gustine Branch Library, California, <i>Knowledge</i>	10
Imperial County Free Library, California, <i>Connections</i>	6
Richfield Public Library, Utah, <i>Nature</i>	26
Stair Public Library, Michigan, <i>Survival</i>	25
TOTAL	77

1. How did you learn about today’s “Pushing the Limits” event? If you heard about the event in several ways, please list them all. For example, “from the library’s website and from my neighbor,” or “from a flyer at the grocery store and a newspaper ad,” etc.

	Georgetown (N=10)	Gustine (N=10)	Imperial (N=3)	Richfield (N=21)	Stair (N=20)
Previous library event or meeting	10%	–	–	5%	15%
Library poster, display, flyer, bookmark	10%	20%	–	14%	45%
Library website or online calendar	–	–	–	10%	–
Library newsletter, mailing, email list	–	–	–	24%	10%
Library staff	60%	60%	33%	19%	30%
Library (not otherwise specified)	20%	–	–	–	25%
Word of mouth: friends, family, neighbors, etc.	–	–	33%	14%	20%
Social media: Facebook, Twitter, LinkedIn, Google+, Pinterest, etc.	–	–	–	–	10%
Radio promotion or ad	–	–	–	10%	–
Newspaper or magazine story or ad	–	30%	–	14%	55%
School or teacher	–	–	–	43%	–
Other	–	–	33%	–	–

Note: Percentages may exceed 100% as respondents were able to list multiple options.

2. Why did you decide to attend this event? (Check all that apply.)

	Percentage
To support the library	75%
To learn something new	64%
Seemed worthwhile to attend	46%
To have a discussion with others	44%

To challenge myself	30%
Topic is of personal interest to me	30%
I enjoyed the book	27%
To support someone else's experience or learning	25%
Topic is of professional interest to me	14%
Other	10%

N=77

Note: Percentages exceed 100% as respondents were able to list multiple options.

3. What did you learn at today's event that was new to you?

Connections (N=8 at 2 libraries)

- How much we do is depend[ent] on nature and our connection awareness.
- How important connection is.
- The effects of digital imaging.
- Current technology: Google glasses, Internet stalking, etc.
- Development of writers' radio.
- That Marconi was more of an entrepreneur than a scientist.
- A lot actually. Indians and Russians. History, philosophy, ethics. Wide-ranging but also interesting details.
- The story.

Nature (N=17)

- How protective people are of animals, how books portray this.
- How much people really do care about the environment and the animals there.
- People's feelings and beliefs on wildlife management in my area.
- Didn't know about \$7 million spent to recover islands.
- I didn't know anything about the channel islands.
- This book happened in channel islands.
- How powerful books are.
- There are two sides to every story.
- Who is the invader?
- The problem of how far to go to preserve.
- 98% of all species that ever existed are extinct.
- 98% of species are extinct.
- That rats are like weeds.
- Rats 150 years on island, TC Boyle has an interesting hairdo.
- Dingo — wild dogs
- I hadn't read the book, so it was all new.
- Nothing.

Survival (N=12)

- I never thought of all the ways that survival was depicted through the book and videos.
- Survival comes in more everyday events than I realized.
- Different types of survival.
- Different ways of survival.
- The things people do for survival that they had no idea they were capable of.
- Pushing the limits — personally, in science, etc.
- Th[at] we relate to science and the world around us.
- I just enjoy getting another’s perspective.
- Combine demolition.
- High school kids are cloning things.
- How many people use this library.
- Nothing.

Knowledge (N=7)

- Some interesting new facts about food producing and processing.
- Genetically processed seed that won’t produce after the second generation.
- Through discussion, I learned about genetically engineered seed that only grow one season.
- Genetically altered crops that die after one generation.
- Some of the discussion on cave drawings.
- I didn’t realize that other people would have the same view as me. I also found it interesting that pushing one’s limit is innate to humans.
- Today’s event was the exception. Normally I had an easy time connecting with the books and I learned a great deal from the discussion. I had a harder time connecting with Auel’s book. Nonetheless, the discussion was stimulating.

4. Overall, how effective was this event at:

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
...making you want to attend other public discussion events like this?	4.24	–	3%	15%	40%	43%
...holding your interest?	4.05	–	3%	15%	58%	25%
...teaching you something?	3.84	–	4%	24%	57%	16%
...making you want to learn more about this topic?	3.66	4%	4%	32%	43%	17%

N=76

5. As a result of attending this event, how likely are you to do the following?

	Mean (1-5)	Very unlikely (1)	Unlikely (2)	As likely as not (3)	Likely (4)	Very likely (5)
Attend another “Pushing the Limits” event at your library.	4.45	3%	–	8%	29%	61%
Seek out other similar learning	4.12	–	4%	16%	43%	37%

	Mean (1-5)	Very unlikely (1)	Unlikely (2)	As likely as not (3)	Likely (4)	Very likely (5)
experiences.						
Talk about the event with others.	4.06	1%	3%	10%	60%	26%
Look for information on something you learned about at the event.	3.80	–	9%	19%	55%	17%
Use information from the event in your work/studies.	3.36	4%	17%	32%	33%	14%

N=72-77

6. How engaging was each of the following aspects of the event?

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
The co-host, [<i>science partner</i>]	4.48	–	–	7%	38%	55%
Video segment with [<i>human interest story</i>]	4.31	–	3%	9%	43%	46%
The discussion among audience members	4.21	–	2%	10%	54%	34%
Video segment with [<i>author</i>]	3.93	–	3%	19%	61%	17%
Book, [<i>title</i>]	3.74	6%	4%	23%	47%	21%

N=53-69

Note: These items were customized depending on the topic of that event. Respondents had the option of saying “I did not experience/participate in this.”

7. Do you think the library should continue to offer public discussion events like this one?

Mean (1-5)	Definitely not (1)	Probably not (2)	Neutral (3)	Yes, probably (4)	Yes, definitely (5)
4.74	–	–	–	26%	74%

N=74

8. Based on your experience at this event, how likely is it that you will attend a similar public discussion event in the future?

Mean (1-5)	Not at all likely (1)	Only a little likely (2)	Somewhat likely (3)	Very likely (4)	Extremely likely (5)
4.22	–	–	20%	38%	42%

N=74

9. How could we improve events like this?

	N
More or better publicity and advertising	36%
Larger and/or wider audience	32%
Longer program with more meetings	16%
More interesting or shorter books	16%
More food and water at meetings	12%
Other	8%

N=25 respondents listed 30 suggestions.

Note: Percentages exceed 100% as respondents were able to list multiple suggestions.

10. What kinds of topics are you generally interested in?

At Least One STEM Topic (29% of respondents)

- History, **nature**, craft.
- History, **nature, any science (natural)**.
- History, literature, **science, technology** — we are open to anything
- History, **science**.
- History, agricultural history, economics, **technology**.
- History, **environment**.
- History, **nature topics**, human interest — people, not political.
- **Nature**, Native American.
- **Environmental issues**. Historical, I'm up for about everything.
- **Life science, interactions between people and the earth**.
- **Science, nature, technology**.
- Literature, **gardening**, writing, world travel.

Non-STEM Topics (71% of respondents)

- History, especially local, music, art, folk culture, local/regional literature.
- I prefer topics on art, history, literature, culture, and current events. I like the fact the program as a whole touched on topics I am familiar with, but also provided new insight.
- History, genealogy.
- History. (2)
- Mystery, history.
- History, general non-fiction.
- History, language arts.
- History, religions, new age.
- Classic books.
- Art.
- Cultural topics.
- Juggling.
- Law, crime, mystery.
- Cameron.
- This one.
- Anything adult. Has to be above Twilight-level reading.
- I enjoy hearing new things and hearing the different thoughts on the topics.
- I'm very interested a lot of different topics; the more topics the better.
- Interesting stuff...you know.
- Various.
- Broad range.

- Most. (2)
- Everything. (2)
- Pretty much everything.

11. How knowledgeable do you consider yourself to be about each of the following topics?

	Mean (1-5)	Not at all (1)	Only a little (2)	Somewhat (3)	Very (4)	Extremely (5)
History	3.39	1%	8%	47%	36%	7%
Geography	3.28	–	7%	61%	30%	3%
Social science	3.28	1%	17%	42%	31%	9%
Languages/language arts	3.28	6%	15%	36%	32%	11%
Science	3.18	1%	18%	47%	28%	6%
Math	2.97	4%	25%	44%	22%	4%
Art/art history	2.86	6%	28%	49%	11%	7%

N=71-72

12. Is there anything else you’d like to share with us?

Georgetown (N=5)

- Thank you for this series. Hope it continues.
- Let’s do similar events soon!
- I have enjoyed the series. These aren’t the kinds of book I usually choose, so I was glad to push myself into a realm outside of my normal interests. Jeff has enhanced the experience with this well-prepared discussion.
- Great, love the knowledge of host. Love the information picture and displays.
- Book wasn’t available for me to read.

Gustine (N=4)

- I wish I had been able to participate in the earlier books.
- Wish there were more programs; four was not enough.
- Will miss the programs.
- The 3rd video (about the crop ranchers in the Midwest) that features a family working on equipment for competition in a destruction derby was not effective. We were disappointed with that one. Their “recreation” seemed like a wasted effort, not worthy of a “salt-of-the-earth” farm family. The video segments narrated by the authors were great.

Imperial (N=3)

- I enjoyed myself immensely.

Richfield (N=10)

- So glad we have benefited so much as a community from this science grant!
- This was a great experience for our community; thanks!
- Thanks, Linda and Judy.
- Thanks!
- Thank you!
- Was nice; thanks for being here.

- Great evening!
- I was offended when the woman said that Native Americans come into a civilized community then go back to the way they live. I hope she didn't mean that.

Stair (N=1)

- Book choices tend to be too long. Didn't have enough time to read.